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TWENTY-NINTH ANNUAL REPORT

OF THE

Illinois State Beekeepers' Association

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1929

THIRTY-NINTH YEAR OF ASSOCIATION

Organized February 26, 1891, at
Springfield, Illinois

Compiled by

V. G. MILUM

Champaign, Illinois

[Printed by authority of the State of Illinois.]

JOURNAL PRINTING COMPANY,
SPRINGFIELD, ILL.
1930

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LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,
Champaign, Illinois, March 10, 1930.

To His Excellency, Louis L. Emmerson, Governor of the State of Illinois:

SIR: I have the honor to transmit herewith the Twenty-ninth Annual Report for the thirty-ninth year of the Illinois State Beekeepers' Association.

V. G. MILUM, *Secretary.*

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TWENTY-NINTH ANNUAL REPORT

FOR THE THIRTY-NINTH YEAR

OF THE

Illinois State Beekeepers' Association

OFFICERS OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1929.

DR. A. C. BAXTER - - - - - - President
Springfield

C. A. MACKELDEN - - - - - Vice-President
Jerseyville

EDWARD C. HELDT - - - - - Vice-President
Stanford

EMORY WARNER - - - - - Vice-President
Monticello

EDWIN PETERSON - - - - - Vice-President
Kewanee

A. G. GILL - - - - - - Vice-President
Chicago

ELMER KOMMER - - - - - - Treasurer
Woodhull

V. G. MILUM - - - - - - - Secretary
Vivarium Bldg., Champaign

A. L. KILDOW - - - - - Inspector of Apiaries
Putnam

List of members and index in back of report.

OFFICERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION FOR 1930.

C. A. MACKELDEN - - - - - - President
Jerseyville

CARL H. TUDOR - - - - - Vice-President
DeKalb

LOUIE VANNIS - - - - - - Vice-President
Harrisburg

J. N. KORITZ - - - - - - Vice-President
Buckley

BENJ. H. FISCHER - - - - - Vice-President
Roanoke

A. G. GILL - - - - - - Vice-President
Chicago

ELMER KOMMER - - - - - - Treasurer
Woodhull

V. G. MILUM - - - - - - - Secretary
Vivarium Bldg., Champaign

ACTIVE COUNTY ASSOCIATION SECRETARIES.

(March 1, 1930).

County.	Secretary and Address.
Cook—DuPage	E. J. McCormick, 6810 S. Winchester Ave., Chicago
DeKalb	Carl H. Tudor, 137 Evans Ave., DeKalb
Franklin	John Matelic, 2102 E. Main St., West Frankfort
Fulton	J. E. Watts, Canton
Grundy	Ernest H. Davy, Gardner
Hancock	M. G. Dadant, Hamilton
Henry	Elmer Kommer, Woodhull
Iroquois	L. W. Wise, Watseka
Jefferson	C. F. Anderson, R. 10, Mt. Vernon
Jersey	C. A. Mackelden, Jerseyville
JoDaviess	Ed. Jeffrey, Galena
McHenry-Lake	Ray Page, McHenry
McLean	Wm. B. Brigham, 1301 N. East St., Bloomington
Mercer	W. C. Egbert, Aledo
Montgomery	Wesley W. Osborn, Hillsboro
Northwestern-Independent	Fred Meinen, Baileyville
Ogle-Lee	Miss Elizabeth Ordung, Oregon
Peoria	Mrs. Mary F. Johnson, 418 S. Adams St., Peoria
Piatt	Emory Warner, Monticello
Rock Island	S. T. Peterson, 1615 Sixth Ave., Moline
Saline-Gallatin	Alvin Bell, Ridgway
Stevenson	W. H. McCaffrey, 104 E. Stevenson St., Freeport
Warren	Glenn Glass, Cameron
Whiteside	Lou Bradley, Morrison
Will	A. J. Polcyn, 315 Huchins St., Joliet
Woodford	A. E. Thomas, Secor

MINUTES OF THE THIRTY-NINTH ANNUAL CONVENTION OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION, SPRINGFIELD, ILLINOIS, DECEMBER 3-4, 1929.

The thirty-ninth Annual Convention of the Illinois State Beekeepers' Association, held in the parlors of the St. Nicholas Hotel, Springfield, Illinois, was called to order at 10 A. M., December 3rd, by the President, A. C. Baxter, of Springfield. The minutes of the last meeting were read and approved. President Baxter then gave a short address in which he reviewed the organization of the association 39 years ago and its aims and purposes.

The following committees were appointed by Dr. Baxter: Auditing—C. H. Tudor, DeKalb, and Frank Bishop, Taylorville; Resolutions—C. A. Mackelden, Jerseyville, and S. A. Tyler, San Jose; Banquet—Edward C. Heldt, Stanford; Question box—Edwin Kommer, Cambridge.

The financial reports of the secretary and treasurer were read by V. G. Milum and Elmer Kommer, respectively, and referred to the auditing committee, who at the final business session on the last day of the convention reported them correct and moved their adoption, which action was taken.

These reports showed a total of $610.60 received during the year with total expenditures of $287.10, leaving a balance on hand at convention time of $323.50, as compared to a balance of $305.85 at the 1928 convention.

The general report of the Secretary relating to various matters of policy regarding the conduct of Association activities was read and on motion, adopted.

The Annual Report of the State Apiary Inspector was read by A. L. Kildow of Putnam and adopted by vote of the convention.

Following the opening business meeting the regular program as outlined in the December Bulletin was carried out with the exception that Mr. M. G. Dadant of Hamilton, Illinois, substituted for his brother L. C. Dadant, and Mr. Hambleton of the Bee Culture Laboratories at Washington, D. C., was unable to be present.

Mr. J. F. Diemer of Liberty, Missouri, opened the program with his subject, "Beekeeping as a Business." Chas. A. Kruse of Paris, Illinois, discussed "Producing and Marketing Comb Honey." M. J. Deyell, general manager of the A. I. Root Co. Apiaries, spoke upon the question "Short Cuts in Apiary Management." M. G. Dadant of Hamilton, Illinois, discussed the work, aims and financing of the American Honey Institute. The first day's session was brought to a close in the afternoon by a Question-Box with a number of interesting points brought out by discussion.

A banquet was served in the banquet rooms of the Hotel St. Nicholas at 6:30, on the evening of Tuesday, December 3, with about

thirty-five in attendance. The main speaker on the banquet program was the Honorable H. W. Smith, M. D., member of the General Assembly, Roodhouse, Illinois, who spoke upon the subject, "The Medicinal Value of Honey and Some of Its Other Properties." Mr. J. H. Craig, Assistant Director of the Department of Agriculture, also gave a short discussion, pledging the support of the Department for the betterment of Illinois beekeeping conditions. Mr. Stanley Smith, Director of Publicity of the State Department of Agriculture, suggested ways of popularizing honey and offered his assistance in this program. At a short session later in the evening, V. G. Milum, of the University of Illinois, discussed "Recent Observations on Wintering and Methods of Management."

The second day of the Convention was called to order by President Baxter at 9:15, Wednesday, December 4th. Dr. Baxter, in opening the nomination for President, expressed the opinion that it was time the Association choose some other member as the Association President and asked to be relieved of future active duties, but pledged his active support of the Association in future programs and projects. In spite of this Mr. Kildow again nominated Dr. Baxter and pleaded that he reconsider his decision. Dr. Baxter remained firm in his decision, whereupon, C. A. Mackelden, Jerseyville, was elected President. Mr. M. G. Dadant, then expressed the appreciation of the Association for Dr. Baxter's long and faithful service and moved a rising vote of thanks be extended to him, which received an enthusiastic response.

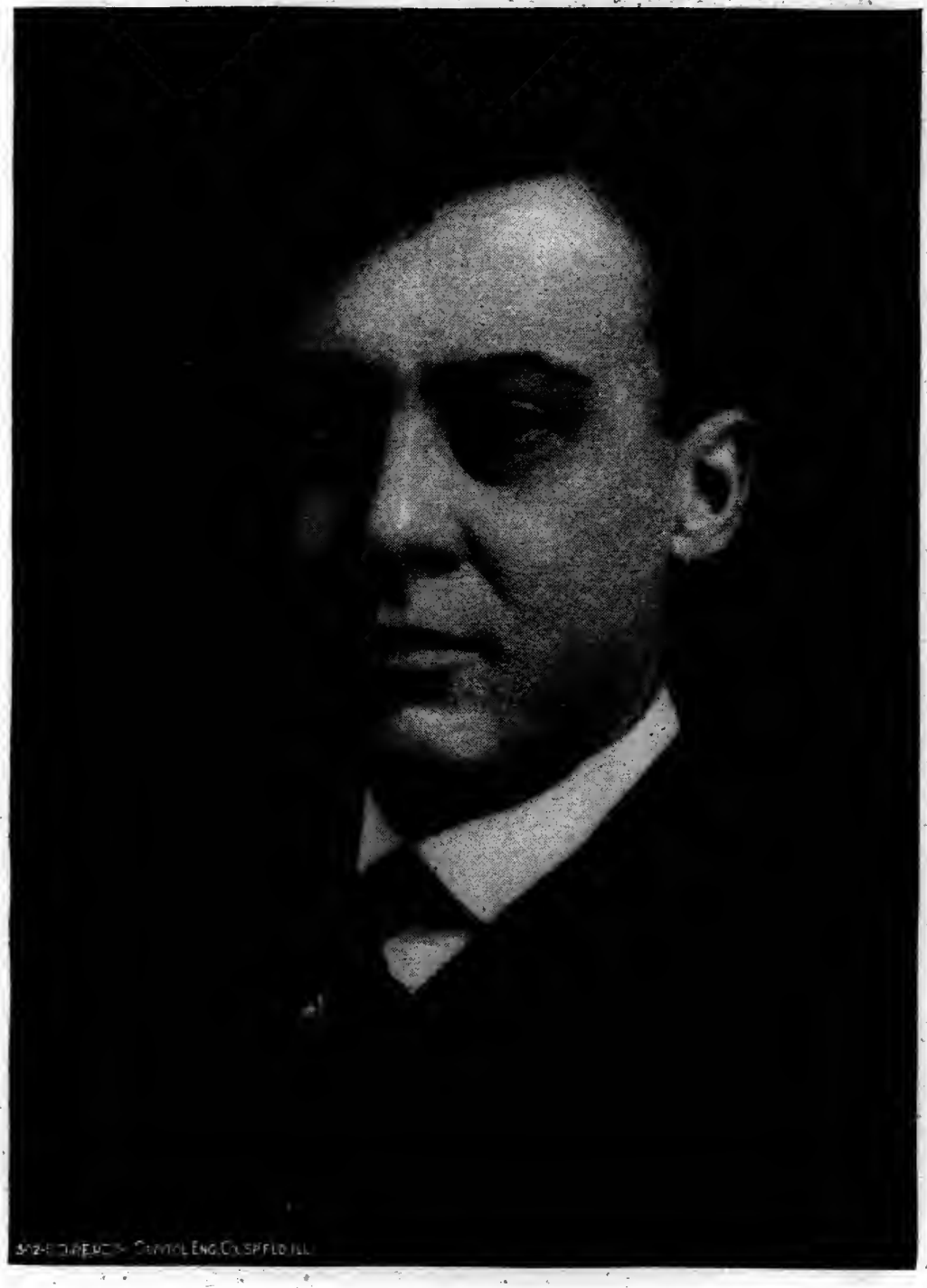
The following officers were then elected by acclamation with no other nominations for the respective positions: Vice-Presidents—Carl H. Tudor, DeKalb; Louie Vannis, Harrisburg; J. N. Koritz, Buckley; Benj. H. Fischer, Roanoke; A. G. Gill, Chicago; Treasurer—Elmer Kommer, Woodhull; Secretary— V. G. Milum, Champaign.

Dr. Baxter brought up the question regarding the code of rules and standards for grading Bees Wax at the State Fair, suggesting that there be made two distinct classes, one of commercial wax, and the other a display of artistic models of wax. On motion of Mr. Tyler, the above suggestion was recommended to the State Fair authorities.

The question of the date for the Annual Meeting was discussed with various opinions expressed, some favoring an earlier date in October or November, while others preferred to adhere to the past plan of holding the meetings in early December. On motion which was carcied the decision was left to the Executive Committee.

Motion made by Mr. Heldt, and carried, that the Association join the American Honey Producers League at an annual fee of $12.00 per year, for membership. On motion that was carried, Mr. M. G. Dadant of Hamilton, Illinois, was appointed the official delegate to represent the Association at the Annual Meeting of the American Honey Producers League held in Milwaukee, Wisconsin, on February 4, 5, and 6.

Moved by Treasurer Kommer, seconded and carried, that the Association take the necessary steps to secure a Fidelity Bond for the Secretary and Fidelity and Depository Bonds for the Treasurer, at an annual cost of $10.00.



DR. A. C. BAXTER, SPRINGFIELD.

Retiring President of Illinois State Beekeepers' Association.

Motion made, seconded and carried, that the Association contribute the amount of $25.00 to the American Honey Institute to aid in the promotion of the use of honey.

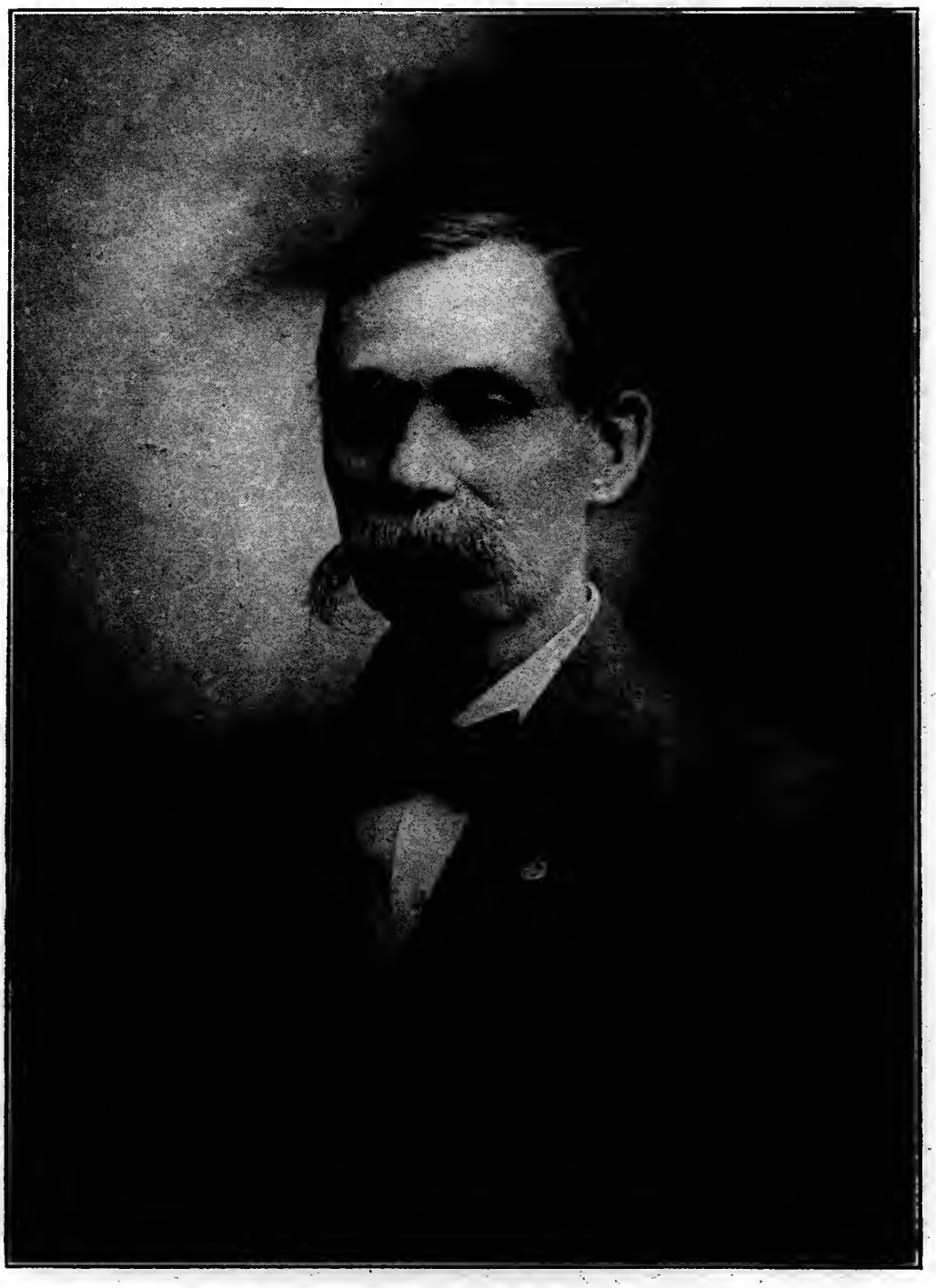
Moved, seconded and carried that for purpose of affiliation of members from County Associations, affiliation fees are not to be accepted for members, less than 10 in number, unless the particular association has shown a total membership per year of 10 members in any one year of the last two years preceding.

The Resolutions Committee then submitted its report with the resolutions as printed in the thirty-ninth Annual Report of the Association, which were adopted by the Convention.

Following the final business session Mr. G. H. Cale, Associate Editor of the American Bee Journal, Hamilton, Illinois, discussed the subject, "Bees in the Orchard," and Mr. Deyell of Medina, Ohio, gave his second talk on "Roadside Marketing."

The meeting adjourned at 11:45 a. m., December 4th, 1929.

V. G. MILUM, *Secretary.*



MR. AARON COPPIN, WENONA, ILLINOIS.

Charter member of Illinois State Beekeepers' Association. Born June 9, 1855, died November 17, 1929.

RESOLUTIONS APPROVED AND ADOPTED AT THE THIRTY-NINTH ANNUAL CONVENTION HELD DECEMBER 3-4, 1929.

Be It Resolved, That the Illinois State Beekeepers' Association in its thirty-ninth annual convention assembled at Springfield, Illinois, December 3-4, 1929, hereby approve and adopt the following resolutions, and that a copy of same be spread upon its books and copies sent to the various appropriate authorities concerned.

1. WHEREAS, "The greatest happiness of a life comes through the power of giving, and the one who is able to give, 'heart and soul,' for some common good, is most to be envied, for that person has not lived in vain."

WHEREAS, The finest and most lasting memorial of a good beekeeper is the gift of a noble service—an imperishable bequest, handed down and down, gathering strength with the years, and defying all efforts to lessen or deface its impress upon the world.

Be It Resolved, In recognition of that faithful service that we dedicate a page of our 1929 annual to the memory of one who has lived that life, and was one of the founders of the Illinois State Beekeepers' Association—AARON COPPIN.

2. WHEREAS, The measure of the true worth of a life is not found in its length nor in the number and variety of its experiences, but rather in the character and depth of the impressions it leaves in the lives of those with whom it comes in touch.

WHEREAS, Fifteen years as president of an association is for the most of us to be counted as an ending, but for the one who has served this association for so long a time, has left a deep and noble impression upon not only the association, but the members as well.

Be It Resolved, In recognition of such faithful service as being President of this Association for that long time, we extend to Dr. A. C. Baxter a vote of appreciation and thanks for the faithful services he has rendered.

3. WHEREAS, The corn sugar interests have in the past few years made several attempts to secure the passage of laws allowing the use of corn sugar for sweetening purposes without so stating on the label of the package or container, and,

WHEREAS, The passage of such a law would destroy the confidence of the consuming public in many desirable food articles, and would tend to undermine the Pure Food and Drug Act, paving the way for other types of adulteration, and.

WHEREAS, Such a law would not make corn sugar more available to the housewife as claimed by its previous sponsors, nor increase the

price of corn for the producer or the farmer according to an opinion of the Secretary of Agriculture, and

WHEREAS, The corn sugar interests in 1928 used various means and methods, such as transporting the hearings from one committee to another in Congress and claiming the support of the Farm Bureau and the National Grange when these organizations had not passed resolutions favoring the law, therefore,

Be It Resolved, That the Illinois State Beekeepers' Association again go on record as opposing any such legislation as proposed by the bills introduced into Congress, or any amendments thereto which may later encourage the breaking down of the Pure Food and Drug Act of 1906, and furthermore,

Be It Resolved, That this association authorize its acting secretary at such time as may be necessary to transmit copies of this resolution signed by the executive committee to the proper representatives in Congress, and to such other important officials and committees in Congress as may have these bills before them for consideration.

4. WHEREAS, There has been a continued call for the grading and inspection of honey and the fact that such inspection and grading is beneficial to the industry, and

WHEREAS, The proper inspection and grading of honey is the only sound basis of fixing prices in the markets, and as properly graded products establish confidence which leads to the establishment of quality prices.

Be It Resolved, That the Illinois State Beekeepers' Association recommend to the Illinois Beekeepers the adoption and use of the rules as set forth in circular No. 24 U. S. Department of Agriculture, subject to such changes as their future use may find necessary, and that the Secretary take such steps as are deemed necessary to acquaint the beekeeper with these rules.

5. WHEREAS, The American Honey Institute has done wonderful good in promulgating the use of honey.

Be It Resolved, That this Association in convention here assembled vote a sum of money to help the Institute continue to carry on the good work and find more outlets for honey.

6. WHEREAS, The encouraging of the people of the State of Illinois to buy home products, will have a tendency to increase the output of same, therefore,

Be It Resolved, That the Illinois State Beekeepers' Association through its members and its secretary encourage the buying of honey produced in Illinois.

7. WHEREAS, An amendment to the Federal Highway Act provides that specification for Federal aid projects hereafter may include planting and maintenance of shade trees for beautifying the highways, and

WHEREAS, It has been reported that the Director of Public Works and the Director of Public Welfare of the State of Illinois are to pool their resources for the beautification of Illinois highways, in a similar manner, and

WHEREAS, There are many trees such as linden, tulip-tree, hard maple, and other trees and shrubs which would be of a distinct economic

value in the building up of colony strength and in the production of honey, while at the same time enhancing the beauty of such highways,

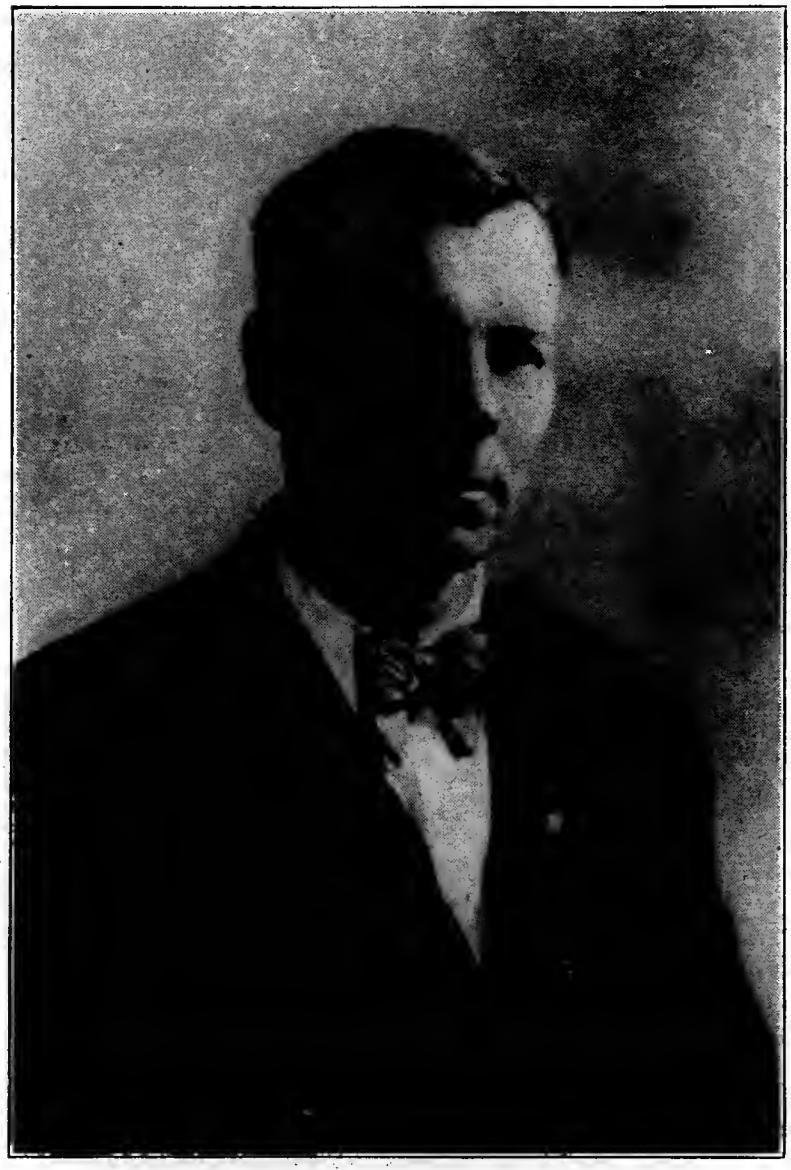
Be It Resolved, That the Illinois State Beekeepers' Association urge that this type of trees and other shrubs be included in the proposed Illinois project, except that trees are not to be planted along or bordering cultivated fields thus reducing the value of the land for crop purposes, and that the proper State authorities be notified of this action.

8. *Be It Resolved,* That a vote of thanks be extended to the authorities of St. Nicholas Hotel, for their continued courtesy and co-operation in allowing the use of the hotel parlors for our meetings and for other courteous services rendered.

9. *Be It Resolved,* That the members of this association hereby extend a vote of thanks to all those who have taken part in its meetings, contributing of their time and efforts to make this convention a success.

10. *Be It Resolved,* That this Association hereby vote thanks to its officers that have served the Association so faithfully the past year.

(Signed) C. A. MACKELDEN,
S. A. TYLER,
Resolution Committee.



ELMER KOMMER, WOODHULL, ILLINOIS.
Treasurer, Illinois State Beekeepers' Association.

REPORT OF THE TREASURER FOR 1929.

WOODHULL, ILLINOIS, *December 3, 1929.*

To the Illinois State Beekeepers' Association—GREETINGS.

I herewith make my Fourth Annual Report as Treasurer of the Illinois State Beekeepers' Association, subject to your approval.

RECEIPTS.

No.		
	Balance on hand at last convention	$305.85
(1)	January 3—Received from V. G. Milum, Secretary	27.75
(2)	December 28—Received from Glenn Glass, Secretary Warren County	5.00
(3)	February 1—Received from V. G. Milum, Secretary	25.00
(4)	March 15—Received from V. G. Milum, Secretary	29.00
(5)	March 15—Received from V. G. Milum, Secretary	15.00
(6)	April 6—Received from V. G. Milum, Secretary	15.00
(7)	May 16—Received from V. G. Milum, Secretary	31.50
(8)	June 7—Received from V. G. Milum, Secretary	14.00
(9)	July 16—Received from V. G. Milum, Secretary	13.50
(10)	September 17—Received from V. G. Milum, Secretary	31.50
(11)	September 17—Received from V. G. Milum, Secretary	30.50
(12)	October 14—Received from V. G. Milum, Secretary	26.00
(13)	November 20—Received from V. G. Milum, Secretary	9.00
(14)	November 27—Received from V. G. Milum, Secretary	3.50
(15)	December 3—Received from V. G. Milum, Secretary	28.50
	Total receipts	$610.60

EXPENDITURES.

Voucher No.		
(1)	Elmer Kommer, expense to annual convention, December, 1928	$20.50
(2)	V. G. Milum, expense to annual convention, December, 1928	24.85
(3)	March 7—V. G. Milum, Secretary, 3 months' salary	50.00
(4)	June 1—V. G. Milum, Secretary, 3 months' salary	50.00
(5)	October 11—V. G. Milum, Secretary, 3 months' salary	50.00
(6)	November 2—V. G. Milum, expense executive meeting, October 16	8.72
(7)	November 2—C. A. Mackelden, expense executive meeting, October 16	6.50
(8)	November 2—Elmer Kommer, expense executive meeting, October 16	15.12
(9)	November 21—V. G. Milum, Secretary, 3 months' salary	50.00
(10)	November 21—V. G. Milum, wreath and telegram, Coppin funeral	11.41
	Total expenditures during term	$287.10

RECAPITULATION.

Total receipts	$610.60
Total expenditures	287.10
Balance on hand	$323.50

(Signed) ELMER KOMMER,
Treasurer, Illinois State Beekeepers' Association.

December 4, 1928.

We, the auditing committee, have examined these records and have found them correct.

(Signed) C. H. TUDOR,
FRANK BISHOP,
Auditing Committee.

FINANCIAL REPORT OF THE SECRETARY FOR PERIOD BEGINNING DECEMBER 6, 1928 AND ENDING DECEMBER 3, 1929.

RECEIPTS.

Balance in Treasury at last convention, December 6, 1928..... $305.85

Received by Secretary and transmitted to Treasurer or received by Treasurer direct according to the following Membership Dues Receipt Numbers:

Receipt No.	Date received by Treasurer	Description	Amount received by Secretary	Remitted for Bee Journals	Remitted to Treas.
No. 1	January 3	Members at Large.....	$19.75	$7.00	
		Henry Co. Assn.....	2.50		
		Cook-DuPage Co. Assn..	4.50		
		DeKalb Co. Assn.....	4.00		
		Stephenson Co. Assn...	4.00		
			$34.75	$7.00	$27.75
No. 2	December 28 ..	Warren Co. Assn.....	($5.00 to Treasurer)		5.00
No. 3	February 1 ...	Members at Large.....	7.00		
		JoDaviess Co. Assn.....	2.50		
		Rock Island Co. Assn...	11.00		
		Jersey Co. Assn.....	.50		
		Moultrie Co. Assn.....	1.50		
		Champaign Co. Assn. ..	3.00	.50	
			$25.50	$0.50	25.00
No. 4	March 15	Members at Large.....	$ 5.50	$1.00	
		JoDaviess Co. Assn.....	.50		
		Piatt Co. Assn.....	4.50		
		Woodford Co. Assn.....	4.00		
		Jersey Co. Assn.....	4.00		
		Henry Co. Assn.....	11.50		
			$30.00	$1.00	29.00
No. 5	March 15	Cook Co. Assn.....	$15.00		15.00
No. 6	April 6	Members at Large.....	2.00		
		Jersey Co. Assn.....	1.00		
		Woodford Co. Assn.....	.50		
		Grundy Co. Assn.....	4.00		
		Whiteside Co. Assn.....	6.00		
		Stephenson Co. Assn...	1.00		
		Franklin Co. Assn.....	.50		
			$15.00		15.00
No. 7	May 16	Members at Large.....	$10.00	$3.00	
		Peoria Co. Assn.....	.50		
		Cook Co. Assn.....	8.00		
		Hancock Co. Assn.....	.50		
		McLean Co. Assn.....	4.00		
		Jefferson Co. Assn.....	3.50		

Receipt No.	Date received by Treasurer	Description	Amount received by Secretary	Remitted for Bee Journals	Remitted to Treas.
		Saline-Gallatin Co. Assn.	6.50		
		Henry Co. Assn.....	1.50		
			$34.50	$3.00	31.50
No. 8	June 7	Members at Large	$3.50	$0.50	
		Northw. Indpt. Assn....	3.50		
		DeKalb Co. Assn.....	1.00		
		Saline-Gallatin Co. Assn.	1.00		
		Champaign Co. Assn...	1.00		
		Woodford Co. Assn.....	.50		
		McLean Co. Assn.....	1.00		
		Piatt Co. Assn.....	2.50		
		Jersey Co. Assn.....	.50		
			$14.50	$0.50	14.00
No. 9	July 16	Members at Large.....	$6.00	$1.50	
		Montgomery Co. Assn..	2.50		
		Piatt Co. Assn.....	.50		
		Woodford Co. Assn.....	.50		
		Champaign Co. Assn...	1.50	.50	
		(50c to County Assn.)	.50		
		Cook Co. Assn.....	1.50		
		Jersey Co. Assn.....	1.00		
		Northw. Indpt. Assn....	1.50		
		DeKalb Co. Assn.....	1.00		
			$15.50	$2.00	13.50
No. 10	September 17 .	Members at Large	$13.00	$1.00	
		Jefferson Co. Assn.....	1.00	.50	
		Iroquois Co. Assn.....	5.00		
		JoDaviess Co. Assn.....	5.50	2.00	
		Williamson Co. Assn...	.50		
		Woodford Co. Assn.....	1.00		
		Jersey Co. Assn.....	1.00		
		Champaign Co. Assn...	1.00	.50	
		Cook Co. Assn.	7.50		
			$35.50	$4.00	31.50
No. 11	September 17 .	Members at Large.....	$5.50		
		DeKalb Co. Assn.....	6.50		
		Henry Co. Assn.....	1.00		
		McHenry Co. Assn.....	4.50		
		JoDaviess Co. Assn.....	4.00	2.00	
		Ogle-Lee Co. Assn.....	.50		
		Jersey Co. Assn.....	.50		
		Piatt Co. Assn.	1.50		
		Jefferson Co. Assn.....	1.00		
		Whiteside Co. Assn.....	1.00		
		Cook Co. Assn.....	6.50		
			$32.50	$2.00	30.50
No. 12	October 14	Members at Large.....	$8.00	$1.00	
		JoDaviess Co. Assn.....	1.00	.50	
		Henry Co. Assn.....	3.00		
		Ogle-Lee Co. Assn.....	6.00		
		Peoria Co. Assn.....	1.00		
		Champaign Co. Assn....	1.00	.50	
		(50c to County Assn.)			

Receipt No.	Date received by Treasurer	Description	Amount received by Secretary	Remitted for Bee Journals	Remitted to Treas.
		Hancock Co. Assn.....	.50		
		Woodford Co. Assn.....	1.50		
		Will Co. Assn.....	.50		
		Fulton Co. Assn.....	5.50		
			$28.00	$2.00	26.00
No. 13	November 20	..Members at Large.....	$1.00		
		JoDaviess Co. Assn.....	1.00	.50	
		Fulton Co. Assn.....	.50		
		Mercer Co. Assn.....	7.00		
			$9.50	$0.50	9.00
No. 14	November 29	..Members at Large.....	$3.50	$0.50	
		DeKalb Co. Assn.....	.50		
			$4.00	$0.50	3.50
No. 15	December 2	..Members at Large.....	$10.50	$2.50	
		Montgomery Co. Assn..	2.50		
		Hancock Co. Assn.....	3.50		
		Rock Island Co. Assn...	14.50		
			$31.00	$2.50	28.50
		Totals.....	$330.25	$25.50	$304.75

Totals received by Secretary and Treasurer.....	$330.25
Remitted by Secretary for bee journals.....	25.50
Total received or remitted to Treasurer.....	$304.75
Balance on hand December 6, 1928.....	305.85
Total receipts for year ending December 3, 1929.....	$610.60

EXPENDITURES.

From December 6, 1928, to December 3, 1929, by vouchers as follows:

No. 1—December 13, 1928—Elmer Kommer, expenses to annual convention at Springfield, Illinois, December 6 and 7, 1928.....	$20.50
No. 2—December 13—V. G. Milum, expenses to annual convention at Springfield, Illinois, on December 6 and 7, 1928, including telegrams and ice cream for Tracy's demonstration.....	24.85
No. 3—March 4, 1929—V. G. Milum, 3 months' salary.....	50.00
No. 4—June 1—V. G. Milum, 3 months' salary.....	50.00
No. 5—October 8—V. G. Milum, 3 months' salary.....	50.00
No. 6—October 30—V. G. Milum, expenses incurred attending executive meeting of association, Springfield, October 17th.....	8.72
No. 7—October 30—C. A. Mackelden, expenses incurred attending executive meeting of association, Springfield, October 17th.....	6.50
No. 8—October 30—Elmer Kommer, expenses incurred attending executive meeting of association, Springfield, October 17th.....	15.12
No. 9—November 20—V. G. Milum, 3 months' salary.....	50.00
No. 10—November 20—V. G. Milum, expenditures account, flowers and messages for Aaron Coppin funeral.....	11.41
Total vouchered from association treasury.....	$287.10

RECAPITULATION.

Total receipts	$610.60
Total expenditures	287.10
Balance on hand December 3, 1928	$323.50
Balance at 1928 annual convention	305.85
Net gain over balance one year ago	$17.65

(Signed) V. G. MILUM,
Secretary Illinois State Beekeepers' Association.

December 3, 1929.

We, the auditing committee, have examined the records of the Secretary and the Treasurer of the Illinois State Beekeepers' Association and find them correct.

(Signed) C. H. TUDOR,
FRANK BISHOP,
Auditing Committee.

MONTHLY MEMBERSHIP AFFILIATION BY COUNTIES—ILLINOIS STATE BEEKEEPERS' ASSOCIATION, DECEMBER 6, 1928 TO DECEMBER 2, 1929.

County.	1928 Members.	1928, 12	Month, 1929.											Total.
			1	2	3	4	5	6	7	8	9	10	11	
Champaign	7		5				2	1	1		1			10
Christian	2													0
Cook-DuPage	76	8		29		16		3	15	13				84
DeKalb	27	8					2	2		13				26
Franklin	2				2									2
Fulton	14											12		12
Grundy	8				8									8
Hancock	16					1						1	7	9
Henry	41	5		23		3				2	2	4		39
Iroquois	16								10					10
Jefferson	15					7			1	2				10
Jersey	(18-1927)		1	8	2		1	2	2	1				17
JoDaviess	16		4	1					7	4	1	1		18
Kane	13													0
McHenry	16									9				9
McLean	15					8	2							10
Mercer	26											14		14
Moultrie			3											3
Montgomery	12							5					5	10
N. W. Independent	12						7	3						10
Ogle-Lee	11									1	12			13
Peoria	19					1					1			2
Piatt	22			9			5	1		3				18
Rock Island	12		22										29	51
Saline-Gallatin	12					13	2							15
Shelby	21													0
Stephenson	10	8			2									10
Warren	3	10												10
Whiteside	11				12					2				14
Will	10											1		1
Williamson	10								1					1
Woodford	17			8	1		1	1	2			3		16
County total	492	39	35	78	27	49	22	18	39	50	17	36	42	451
Members at large	53	12	7	5	2	7	3	4	12	5	6	2	11	76
Entire State	545	51	42	83	29	56	25	22	51	55	23	38	53	528
*Actual members 1929		521	492	483	490	475	448	433	439	467	475	478	505	
Actual members 1928						515	553	576	591	590	588	561	583	

* By actual members is meant those who are paid up for one full year in advance. In some cases members paying dues twice within a year, reduces the actual total of members.

GENERAL REPORT OF THE SECRETARY FOR PERIOD BEGINNING DECEMBER 7, 1928, AND ENDING DECEMBER 3, 1929.

V. G. Milum, Champaign.

After serving as your secretary for the second year my original thought was that I might take the plan of least resistance and omit a general report for the year ending. But since much of what the Association does and accomplishes during the year seems to hang upon the activity of the secretary and since there are many questions on which our membership should be advised I have prepared this general report covering a variety of questions on which I wish you might direct your attention.

The Association Bulletin.

The monthly bulletin of the Association has been issued at nine different times since the last convention with a total of 40 pages of printed material. While the value of some of this material may be rather questionable in the minds of some of the members who read it when it reaches them, your secretary must admit that it is not so easy to find sufficient items to fill up the pages each month.

During the year of 1928 we missed a few numbers without serious results, but with the first monthly issue missed in 1929, the Third Assistant Postmaster at Washington, D. C., demanded that issues be mailed once each month in order to retain our second class mailing privilege, thereby saving several dollars per month. After a lot of begging and apologies we were allowed to continue mailing under this permit. It has been suggested that the bulletin be changed so as to be issued once each two months or only six times a year. This would save the secretary a lot of work but there are perhaps good reasons why the monthly basis should be continued provided our members will help supply items and materials to fill the columns.

Only recently the Third Assistant Postmaster has taken us to task for accepting free advertising from our members, claiming that this service amounts to more than fifty per cent of the annual subscription fee, for individual members, which according to the heading on our bulletin, is 25 cents per year. As announced in the October Bulletin this free service, in fact all advertising is to be eliminated from future issues in order to comply with the ruling of the Post Office Department. The most recent letter from the Third Assistant Postmaster forbids the acceptance of the bulletin by the local postmaster at the second-class rate. As a result, your secretary is holding a receipt for $12.38, regular

postage for mailing the November issue of the Bulletin. The local postmaster is of the opinion that a refund can be secured when the matter is finally straightened out. (Since readmitted to mailing at the regular second class rate.)

The Annual Report.

The Twenty-eighth Annual Report was issued slightly earlier in 1929 than that of the previous year, but a still earlier printing could be accomplished if the local secretaries were more prompt in submitting their reports. Lack of reports from local secretaries made it necessary to compile reports from available information for several county organizations. As a result, we have been severely criticized for publishing what we considered as the truth.

If every one concerned will cooperate, there is no reason why the 1930 secretary cannot get the report out at an earlier date. In most cases local association secretaries and deputy inspectors might just as well send in their reports immediately following this meeting, for all work of the year is completed, since only occasionally will local meetings be held after this convention.

Our Membership.

Our membership has decreased from 545 members paying their dues in 1928 to 528 for the 1929 period between conventions just ending. Because of repetition in payment of dues, actual membership is now 505. In general, the majority of the associations just about maintained their previous level, but there are certain counties where a definite loss is accounted for by a completely inactive association.

For instance in Peoria County the association has shown no activity since the death of its former Secretary, Mr. A. E. Johnson of Peoria. The Shelby County Association organized in 1928 has become inactive because it was made certain promises that were not fulfilled. Other counties suffering loss of members because of inactivity in the form of no meeting or inactive officers are Christian, Franklin, Grundy, Hancock, Kane, McHenry, Moultrie, Vermillon, Edgar, Will and Williamson counties. The secretaries of the Grundy and the McHenry County organizations asked to be included in a series of meetings if such were to be arranged, but there were no requests from counties in the adjoining territories at the times when they were considering meetings.

Again we have evidence that even though our membership at large has increased, our total membership has decreased because of the inactivities of the local associations. Is there some way to stimulate this activity?

All members of the past year whose dues expired previous to November 1 have been sent a notice or request within the last week, in addition to previous notices during the year. Likewise all former members since 1926 and those back to 1922 with more than one year's membership showing on their cards were sent a copy of the November bulletin with the convention program and a plea to get back of the asso-

ciation. Thus approximately 850 former members have been written within the past week and many have already responded with their dues. No doubt many more will be sent in within the next few days.

Death of Members During Past Year.

Through the association bulletin your attention has been called to the death of the following members during the past year:

A. E. Johnson, Peoria, January 9.
Edward C. Brunner, Decatur, January 12.
Wallace Beaver, Lincoln.
T. Scott Hoes, Butler, February or March.
R. E. Wooldridge, Chicago.
Alonzo Wookey, Peoria, October 2.
Aaron Coppin, Wenona, November 17.

Perhaps there are others that have escaped our attention or of which we have not been notified. I am sure the association greatly regrets the passing of these brother beekeepers and has the deepest sympathy for the members of their bereaved families.

Honorary Members.

An attempt has been made to compile a list of all those who have been elected to honorary membership in this association. No doubt, there are others and anyone having evidence or knowledge of the same should notify the secretary in order that a complete list may be made up and printed in the Annual Report. In the back of this report following the account of "Formation of the Illinois State Beekeepers' Association" are listed the names of those who have been elected to honorary membership.

Property of the Association.

Since there seems to be no available records of the materials or equipment supposed to be retained by the association secretary, it seems best at this time to list the property in the hands of the 1929 secretary which is as follows:

The original State charter issued February 26, 1891.
Correspondence and membership records since 1922 only.
One association seal for stamping papers.
Annual reports for secretary's permanent record: 1920, 1922 to 1928.
Annual reports: 1922—40 copies; 1924—65 copies; 1925—40 copies; 1928—100 copies.
One Shaw-Walker filing case, containing six drawers for 3 x 5 cards and one large drawer for correspondence.
One No. 36 Multigraph (serial No. 12653.)
One gravity type setter.
One stand for multigraph.
One extra drum.
A small amount of type (not complete set.)

It is the opinion of the present secretary that the multigraph machine should be traded in for a typewriter which would certainly be more useful. (Exchanged for one Underwood typewriter No. 1715210-5 by payment of $15.00 balance, on March 5, 1930, order Executive Committee.)

Besides the above, there are on hand small supplies of letterheads, envelopes, and forms for financial reports of the State appropriation.

Roadside Tree-planting Project.

A recent Associated Press news item stated that plans were under way for the beautification of the highways of Illinois through the planting of trees and shrubs. Those of us who were here for the convention last year remember that a resolution was passed covering the roadside planting of trees and shrubs by the Federal Government. This resolution was forwarded to Washington, D. C., and a reply returned that it was a good idea that we suggested the inclusion of trees of distinct value for nectar and pollen purposes, as a benefit to the beekeepers. Our resolution was to be referred to other departments, but we have not had any indication as to whether they were favorably received or not.

The Illinois project is to be carried out by the Department of Public Works and the Department of Public Welfare. The Directors of these Departments have already been advised of our 1928 resolution, but we have no reply from them to date. It would do no harm to offer a resolution again this year to the Directors of these Departments suggesting that trees and shrubs of distinct nectar and pollen value be added to the list of those to be used.

(We have since been advised by Rodney H. Brandon, Director of the Department of Public Welfare that although the tulip tree was included in the original list, the linden or basswood is to be added for the benefit of the beekeepers.)

Corn Sugar Legislation.

Fortunately our last convention passed a resolution in regard to corn sugar legislation, for on May 1, we were advised that a new corn sugar bill had been introduced into Congress. We immediately wrote to various members of Congress and Secretaries of various committees and sent requests to local association secretaries to do likewise. Apparently the combined efforts of all beekeepers, their associations and other agencies were sufficient to thwart the passage of this proposed unfavorable legislation.

And now as we are meeting in convention, this legislation is again being brought up in Congress. For future use of your secretary it may be well for this convention to pass another resolution concerning the matter.

Bonding the Secretary and Treasurer.

About a year ago your Treasurer, Mr. Kommer, suggested that we purchase fidelity and depositor's bonds for our association officers who handle our funds. Owing to your secretary's laxness these have not been secured previous to this time, but we now have on hand sample copies of adequate bonds and application blanks for same.

The rate for the Depositor's bond is $5.00 per thousand per annum with a minimum of $5.00 on any one bond, while the Fidelity bonds can be secured at the rate of 25 cents per hundred per annum with a minimum premium of $2.50. At these rates, the total cost to the Association for guarantee against failure of the treasurer's depositing bank and fidelity of both the secretary and treasurer would only be $10.00, which in view of the ever occurring bank failures is probably a good investment. This convention should demand that the secretary get busy for the protection of its funds.

(Approved by convention and 1930 fidelity bonds purchased.)

The American Honey Producers' League.

An invitation has been extended to this association to become a member of the American Honey Producers' League, a national organization of beekeepers who have done much and are still at work for the improvement of beekeeping conditions along national lines.

Our association has been asked to affiliate and to take steps to see that the association is officially represented at the next league meeting to be held at Milwaukee, Wisconsin, on February 4, 5 and 6, 1930.

Without going into the advantages of membership and cooperation, your 1928 secretary wishes to recommend that the Illinois State Beekeepers' Association affiliate with the American Honey Producers' League and take steps to send a representative to the next league meeting or delegate someone who will be in attendance to act as our official representative.

According to a letter of November 27 from Mr. J. A. Munro, Secretary-Treasurer of the League, the affiliation fee is $12.00 for each organization. Our association certainly cannot afford to not be represented on this natioual body of beekeepers when only such a small sum is involved. May I urge that this convention take action and instruct the 1930 secretary to proceed to affiliate with the American Honey Producers' League.

(Convention approved joining with the league and association now affiliated.)

The American Honey Institute.

The American Honey Institute is a young organization which appears to be accomplishing wonderful results in its goal of putting honey into the minds of the consuming public. With Dr. H. E. Barnard whom many of you heard last year, as the director of this organization the institute has been making great strides in establishing contacts with the bakers, the canners, the dietitians, the home economics

teachers, the editors of cook books, home magazines and food columns of our papers throughout the country. The value of the institute to every beekeeper in the work already accomplished is far reaching into the future and cannot be measured in dollars and cents. But its good work should go on, but it cannot without the support of the American beekeepers.

While it is not my purpose to give a long discussion of the American Honey Institute, since the secretary of this organization who is with us at this convention will probably have something to say about the work and financing of the institute, your secretary would like to make one further recommendation and that is that we as an organization, as well as individuals take some action at this convention to place ourselves and our association squarely behind the program of the institute.

(Convention voted to support the American Honey Institute to the amount of $25.00, plus contribution of Illinois beekeepers, which increased total to $44.00 up to March 1, 1930.)

Dates of Future Conventions.

There has been some agitation from associations of surrounding states and certain commercial organizations who are in the habit of furnishing speakers for beekeepers' meetings that some system of cooperation be established whereby groups of states may hold their annual conventions in a series of consecutive dates. This is deemed necessary to curtail expenses and to save time and energy of the visiting speakers. This is especially true if speakers from a distance are to be secured.

From the standpoint of our association your secretary believes it is time that we get in line with the associations of the surrounding states, especially Iowa, Minnesota, Wisconsin and Michigan in the matter of arranging a schedule. In fact, we have already in answer to a query from the Wisconsin Association suggested that Illinois be inserted into the series of the states just named, giving Illinois the dates of December 4 and 5 between meetings at Wisconsin and Michigan. However, these dates may not fit into the programs of the other states, but some suggestion should be made by this convention on the cooperative plan just described.

Future Activities of the Association.

It is often said that an organization that stands still, that attempts nothing new, but rides along in the same old path, eventually loses interest for its members which means its ultimate downfall. Is that to be the outcome of this association? Are we forging ahead? Is everything being done that can be done? Your secretary must admit that he has undertaken no new projects in his two years in office.

What is to be the future? In the convention number of the monthly bulletin issued one year ago a number of projects of other associations were mentioned as possibilities for the Illinois State Beekeepers Association but not a single comment or further suggestion was

made by any member of this association. A membership program was outlined early in the year and a contest proposed but no one has shown any interest, perhaps because our idea wasn't a good one.

Who carries the future of the association? Is it up to the secretary to plan new activities and try to execute them and then take the blame and criticism after the project is started? Or should new projects arise in the minds of its members? It is your secretary's opinion that time should be given at some point in this convention for a discussion of future projects for the good of the association. Perhaps then if good suggestions are made committees can be appointed by the president to plan and put into execution such projects. We must carry on.

REGISTERED ATTENDANCE AT 39TH ANNUAL MEETING OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION AT SPRINGFIELD, ILLINOIS, DECEMBER 3-4, 1929.

Name.	Address.	County.	Number of colonies.	Comb or extracted honey.
A. C. Baxter	Springfield	Sangamon	34	Extracted.
J. N. Koritz	Buckley	Iroquois	70	Both.
Joe H. Bearden	Taylorville	Christian	47	Both.
Geo. S. Sloman	Pawnee	Christian	8	Extracted.
Edw. C. Heldt	Stanford	McLean	240	Both.
O. R. Matthew	Virginia	Cass	140	Both.
Frank Bishop	Taylorville	Christian	145	Both.
R. K. Evans	Hoopeston	Vermilion	106	Both.
S. A. Tyler	San Jose	Logan	250	Both.
W. H. Stumm	Edinburg	Christian	63	Both.
C. D. Greffe	Taylorville	Christian	25	Both.
M. J. Deyell	Medina, Ohio		1,190	Both.
V. G. Milum	Champaign-Urbana	Champaign	(65, U. of I.)	Both.
R. R. Morrill	Batavia	Kane	200	Both.
C. H. Tudor	DeKalb	DeKalb	200	Both.
John Dineen	Springfield	Sangamon	14	Both.
Eugene Bates	Kewanee	Henry	3	Comb.
Edwin F. Peterson	Kewanee	Henry	200	Both.
Louie Vannis	Harrisburg	Saline	50	Comb.
Ralph McInnes	Sidney	Champaign	53	Comb.
C. J. Anderson	Morris	Grundy	130	Extracted.
Mrs. R. R. Morrill	Batavia	Kane		
Mrs. C. H. Tudor	DeKalb	DeKalb		
Benj. H. Fischer	Roanoke	Woodford	50	Extracted.
Alfred E. Thomas	Secor	Woodford	48	Extracted.
Edwin Kommer	Andover	Henry	150	Both.
J. R. Wooldridge	Chicago	Cook	112	Both.
Chas. Kruse	Paris	Edgar	200	Comb.
H. L. Clower	Morrisonville	Christian	40	Comb.
Elmer Kommer	Woodruff	Henry	74	Both.
C. A. Mackelden	Jerseyville	Jersey	36	Comb.
Mrs. A. L. Kildow	Putnam	Putnam		
A. L. Kildow	Putnam	Putnam		
B. F. Bell	Kingston Mines	Peoria	200	Both.
Mrs. B. F. Bell	Kingston Mines	Peoria		
G. H. Cale	Hamilton	Hancock		
E. M. Warren	Maywood	Cook	3	Extracted.
Dr. H. W. Smith	Roodhouse	Greene		
Dadant & Sons	Hamilton	Hancock	475	Extracted.
Fred F. Bellatti	Mt. Pulaski	Logan	44	Both.
S. W. Gasaway	Mt. Pulaski	Logan		

REPORT OF FIRST VICE-PRESIDENT FOR 1929.

(C. A. MACKELDEN, Jerseyville.)

After serving as first vice-president of the Illinois State Beekeepers' Association for 1929, and at the expiration of that time elected to be the president of the association for 1930, I hardly know what to say that would be different to what has already been said by the first vice-presidents of the past and still be of interest to the members of the association.

It has always been a matter of thought with me, why a larger percentage of the members do not attend the local and State meetings. The chance that would come to any member or to any beekeeper would be of the most welcome kind, for they would not only meet their fellow beekeepers of the county and State and learn what they are doing, but would see and hear the leading beekeepers that are engaged in the business. They would hear papers read and discussions upon topics that are of vital interest to all; beset, by the same troubles that confront all of us. They would learn that the topics discussed are not solely along one line of thought, but these topics and discussions cover every phase of the beekeeping industry—as a science, as an art, and as a business.

Many a beekeeper, who has undertaken to accomplish something in the bee business, which if accomplished would be of great benefit, not only to himself, but to others, has in more than one instance, allowed his application to the task to lag, as he encountered difficulties in the way. The end has been either failure or else a mighty poor job, and there have been inevitable regrets that the work was pursued listlessly, when, if that same beekeeper had attended the local and State meetings he could have probably learned something that would have won for him success.

As with the individual, so often with our local associations, starting with enthusiasm to attain certain things which seem almost within grasp, great progress is made over the smooth roads, but as the difficulties arise many of the members lose heart, and cease their efforts. Then there comes a time when only a few of the earnest workers are left pegging away—and overtime at that—while those that could not see success at the spur of the moment became dilatory and neglected paying their dues, which is necessary to carry on the work. The members of any local association should not stand idly by and wait for the reports of the progress or failure, nor to allow the issues that are at stake to hang in the balance, but should put forth a special effort to make the local association a success.

The Illinois State Beekeepers' Association is forging to the front and it is the plain duty of every member to put forth his best effort

to make it a greater success. There is one thing that all members should take into consideration; and that is, the regulation of prices on honey. Its possibilities in the legislative halls; in discouraging bad practices, and encouraging laws that will be a benefit not only to the industrious beekeeper, but the public as well. This association has already done a grand work in the past, which will be of inestimable benefit to the beekeepers of the future.

Every meeting or convention held is for the purpose of the advancement of beekeeping, and if truly mothered by a spirit of progressiveness is bound to produce a beneficent influence directly upon those who meet, and upon those engaged or interested in the business, and indirectly upon the public at large. The effect upon the community at large is usually not marked excepting perhaps when matters of national importance are features of the meetings. The prime motive for the convention, such as the Illinois State Beekeepers' Association annually hold, is a desire on the part of its officers to see that all beekeepers attending gain materially and intellectually. The wise beekeeper discerns and recognizes the relative value of the various opportunities which present themselves at the convention.

Every beekeeper is indebted to his business, and every one is morally bound to pay as large a share of that indebtedness as comes within his possibility to pay. If he pays that indebtedness with the least inconvenience to himself, that is his advantage, to which he is entitled, but when payment of this debt is made so convenient as it is by the local and State associations where they meet, it is a wonder not more show their willingness to meet what rightly may be called an obligation. We should all want to meet and congratulate the ones that are doing good public service in advancing our favorite business. To hear them expound some new fact or exhibit some new experiment, is a greater pleasure than to simply read about it. To absorb new knowledge that will be of future advantage to all of us, and perhaps put more money into our pockets, and to save us a loss that might be great, are no trivial considerations in making up our minds to leave the weariness and sometimes heart-aching strain of the usual round of the beekeeper.

The beekeeper who sticks to his little sphere without attending any meetings that are for his interest, usually becomes a pessimist and thinks the world is surely going to the bad. He should attend these meetings and become an optimist and keep himself in the path of cheerfulness. We should all remember the story of the well buckets and avoid being like the one that complained, because that no matter how full it was drawn up it always went back empty. How much better it is to feel like its neighbor, that no matter how empty it went down it was always sure to come back full! May all the beekeepers in Illinois take life as easy and as pleasant as your circumstances will permit. May all of you see and learn as much of the bee business as you can while young enough to enjoy it, for the time will come when cankering age will take away all zest from life, and you will then only ask to be let alone.

EFFECTIVE SHORT-CUTS IN APIARY MANAGEMENT.

(M. J. DEYELL, Medina, Ohio.)

It is very necessary nowadays for beekeepers to reduce expenses connected with apiary management to the minimum, in order to make a profit in beekeeping. The goal of beekeeping should be to produce and market the maximum amount of honey at the minimum of expense. Only when this is done, can the beekeeper realize maximum profit.

We as beekeepers are apt to get into the habit of doing the same thing in the same way, year after year, when, as a matter of fact, we may be able to cut down on our labor without neglecting the really essential factors in apiary management.

In the production of honey, whether it be comb or extracted honey, the program is planned almost a year ahead. The aggressive, successful beekeeper must have a mental picture of his apiary, that is, the condition of his colonies, boiling over with bees of the honey gathering age, ready to take advantage of the beginning of the major honey flow. This means that he must begin his preparation for next season's honey crop, even before this season's honey crop is off the hive.

Seasonal apiary management may well be divided into four parts, fall, winter, spring and summer management. In this latitude for instance, fall apiary management begins about August 1st, or possibly earlier.

The important factors in fall apiary management are: That each colony going into winter quarters should have a young, vigorous, prolific queen of a known honey gathering strain; that it have an ample amount of good stores of the proper quality, not less than fifty pounds and ample protection from the cold winter weather.

Right here I want to introduce some actual experiences with using the food chamber to supply the necessary winter stores, which experiences have convinced me that the proper use of the food chamber solves many of the so called evils of beekeeping. Up until a few years ago, after the major honey flow, we stripped each hive of all supers down to the brood chamber. It was usually, in fact, nearly always necessary to do a lot of sugar syrup feeding during October, to make up the deficiency in natural stores to feed the colonies for winter.

During the fall of 1922 we fed approximately two thousand ten-pound pails of thick sugar syrup to over one thousand colonies of bees. This meant considerable expense in labor and granulated sugar, not to mention the inconvenience of traveling to and from out-apiaries through mud and rain, and disturbing the morale of colonies late in the fall while they are entering their period of quiescence.

During the summer of 1923 we decided to carry out, on a moderate scale at least, the food chamber method of supplying necessary stores for bees. In one of our honey producing apiaries we selected thirty-two colonies in double walled Buckeye hives, and retained for each of these colonies a well filled shallow extracting super of honey. It became necessary to devise a scheme for packing the food chambers placed on the double walled Buckeye hives, and so we originated what we called a packed rim for the food chamber. This rim fits down around the food chamber, and the bottom of the rim conforms with the shape of the water table in the hives. The chaff tray of the Buckeye hive is placed on top of the food chamber, the edges of the chaff tray resting on the top of the packed rim. The cover of the Buckeye hive telescopes over the chaff tray. We were anxious to know how these colonies would winter in these hives. The following spring, we found every colony alive and in splendid condition, in fact, stronger in bees than the colonies wintered in single story Buckeye hives.

During the summer of 1924 we planned to use five hundred well filled supers of the shallow extracting size, as food chambers. We couldn't see the economy of hauling honey needed by the bees for stores away from the apiary, then making up sugar syrup and hauling it back to the apiary to supply the deficiency in food. We decided to let the bees gather their own winter stores. They can do it cheaper, and if honey gathered early in the summer is selected for winter stores, the bees are likely to winter well. If there is any question regarding the quality of the stores, as for example, honey-dew among the honey, each colony should be fed at least a ten-pound pail of sugar syrup made of two parts of granulated sugar to one part of water, after the cessation of brood rearing. In the far north where bees have few if any winter flights it is good practice to feed a ten-pound pail of thick sugar syrup in the fall, even though the bees seem to have an abundance of honey.

Not only does the food chamber supply the needed stores but we noted that the presence of a food chamber on the hive during the late summer and fall months has the tendency to cause each queen to lay prolificly and thus produce very populous colonies of vigorous young bees to go into winter quarters. Thus, one of the essential wintering requirements, namely, populous colonies of young bees, is brought about by the abundance of stores. Furthermore, colonies of two story hives have more space to expand and are likely to be stronger in bees than colonies in one story hives.

In regions where a fall honey flow follows a summer honey flow, the food chamber of honey should be raised up and empty supers placed under it to hold the fall crop. After the fall honey is removed, the food chamber of well ripened honey placed directly on the brood chamber puts a good quality of winter stores right where the bees need it. A cluster of bees can easily move laterally between the two sets of combs. It should be said that a colony that has occupied a two story hive requires more packing than a one story hive, because there is more space in a two story hive to keep warm. However, a colony in a two story hive is likely to be more populous in bees than a one story colony, and

therefore the larger colony is better able to accommodate itself to the two story hive.

Little if any labor is necessary during the fall, except to give the colonies the necessary amount of protection against cold winter weather. The food chamber takes care of the food requirements.

During the winter, the beekeeper need not worry about his bees, provided the essential requirements have been attended to in the fall. Once in a long while there may come a nice storm, which may have a tendency to clog the main entrance of the hive. In our apiaries we use a five-eighth inch tube about two inches and half above the main entrance. We call this the safety valve. This obviates any possibility of the bees becoming smothered during the winter months.

During the spring months, prior to the major honey flow, the two major requirements for bees are, ample stores and ample comb space. The food chamber supplies these requirements. When the queen has occupied practically all of the comb space in the brood chamber proper, more cells are available for the queen in the food chamber as the honey is consumed. Thus she extends her brood rearing into the food chamber.

In localities where there is a heavy spring honey flow from the fruit bloom and dandelions, it may be necessary to put on an additional deep super, preferably dark combs, on each colony to provide more room for brood rearing and thus lessen overcrowding and the danger of swarming. As a rule, however, a two story hive will hold a colony until the beginning of the major honey flow, unless the spring honey flow is unusually heavy.

It will thus be seen that during the spring months the beekeeper has little labor, except to check through the apiaries, for disease, if there is likely to be any, also to get a line on the condition of the colonies, to know if any need strengthening with package bees, or requeening. Quite often, there will be a few failing queens that need to be replaced.

When the main honey flow begins, the queen, which up to this time, has had access to the combs in the brood chamber and the food chamber, is put down into the brood chamber below a queen excluder, and the supers are added as needed. It seems preferable to keep the food chamber on top to invite the bees into the fresh supers more quickly.

In the production of comb honey, the apiary management is similar up to the beginning of the main honey flow. At that time the food chamber is removed and stored temporarily over a weak colony. This is done at the time of giving the first comb honey supers, or a day or so later. At the close of the main honey flow the comb honey supers are removed and the now well filled food chamber is put back on the hive.

The importance of supplying plenty of comb space for the storage of incoming nectar cannot be over emphasized. Many tons of honey are lost because beekeepers fail to provide storage space at the proper time. Bees need comb space for ripening raw nectar. When supers are not given in time colonies prepare to swarm. It pays, therefore to keep ahead of the bees, to anticipate their needs, and thus prevent swarming before they get the swarming fever.

Many successful honey producers practice annual requeening. It seems to me this is especially advisable in the production of extracted honey, when queens are called upon to do so much work in such a short period of time. In the production of comb honey when brood rearing is not quite so heavy, annual requeening may not be quite so important. In any event, it pays to have the best queens obtainable in every colony in order to secure the maximum crop of honey.

This short-cut has reference to rearing a young queen in the food chamber. It can be accomplished in a locality that gives a honey flow of considerable duration. Sweet clover regions are especially well adapted to it. All the extra equipment required for each hive is a hive cover and a hive bottom. The system is as follows:

When the major honey flow starts and supers are put on, remove the food chamber, which at this time should contain considerable honey also some brood, to a hive stand placed close to and facing the same direction as the parent colony. The food chamber is immediately depleted of its old bees which return to the parent stand, but the young bees remain. A ripe queen cell should then be given to the food chamber hive. In due time, a young queen will be mated and laying. She will not be permitted to do much laying, because honey will be crowded around the brood nest. This is exactly as it should be. The hive is primarily for food not brood.

At the close of the main honey flow, when the surplus honey is removed from the parent colony, the food chamber hive containing the young queen after having the bottom board removed is then placed on top of the original colony. When uniting is done during October, no fighting will occur. It has been demonstrated that the young queen is the one that survives, in the majority of instances. The theory seems to be that when two colonies are thus united, the bees in the upper hive being compelled to find the entrance, travel down through the combs in the lower hive and discover the strange queen and immediately kill her. On the other hand, the bees in the lower hive, not having occasion to go above, do not discover the strange queen, and thus she is allowed to live. We have demonstrated in our own apiaries that this theory actually works out in practice. Our Mr. Demuth has been practicing it for a number of years in his apiary in Indiana. How simple then, is the matter of requeening. With this management the food chamber accomplishes requeening as well as reserving ample food for the colony. But that is not all. In the production of extracted honey this method obiviates handling the food chamber, while supering during the honey flow. Then too, when the two colonies are united in the fall, the resulting colony is very strong in bees, which is a major requirement for successful wintering.

As before stated, this new kink or short cut should not be tried, except in localities where there is a heavy honey flow. If attempted in a region which gives a short honey flow, the food chamber on the new stand during the honey flow might not be well filled.

It will thus be seen that all of the requirements in successful apiary management depend on or center around the proper use of the food chamber hive.

In regions where there is practically no fall honey flow, the full depth food chamber is preferable. In localities where there is a dependable fall honey flow, the shallow extracting super is usually large enough. The full depth food chamber is, however, growing in favor for two reasons: First, because it is more likely to contain an ample amount of stores; and, second, because the frames in the food chamber are interchangeable with frames in the brood chamber.

During these days of comparatively low honey prices and keen competition, when honey is clamoring for its rightful first place among sweets, beekeeping, in order to be made profitable must be shorn of all non-essentials in apiary management, in order to be profitable. The beekeeper who discovers and applies the essential principles that govern success, is bound to succeed, whereas the beekeeper who fails to discover and apply essential requirements to his business will fall by the wayside. It is possible to succeed. Let's do it.

BEEKEEPING AS A BUSINESS.

(J. F. DIEMER, Liberty, Missouri.)

As a beekeeper that has no other business, I believe it is more practical to talk on a piece of paper, using a typewriter to do the talking, and keeping my mouth shut. Beekeepers are usually full of words that we want to turn loose on a very patient and intellectual audience of men that usually knows as much as the speaker. Especially such men and women as attended the Illinois Convention this winter, what one didn't know, some one else did, the question box proved this, as all questions were answered by some one that knew.

Beekeeping as a business should be spoken of as a specialty, not as a sideline. The sideline beekeeper is only partly in the bee-business, his mind is divided up into two or more parts. A man that can split his mind into two or more parts, and at the same time get each part to function separately and accurately is the wonder of people like myself, who is like the dog that tried to run on both sides of a fence post while chasing two rabbits. The beekeeper who is trying to chase two lines of business, can not concentrate on either, because both demands the best of attention. I am well aware that some men seem to be able to make a success in the management of two or more business ventures, but how much better would they do if the mind was given wholly to one line.

Fear of failure causes some to make beekeeping a sideline. Fear shows want of confidence; and at the same time it does not look like fear when you decide that you are qualified to handle two lines of business. No one can manage a farm and a store at the same time, his mind is either on the store or on the farm. If he can seem to make a success of both, what would hinder him from making a better success if he only had the one business, and increased and expanded that one business.

There is no limitation on any business, expanding and making it bigger and bigger. A business is big enough for any man. The limit has never been reached by any man. The possibilities of beekeeping are as great as any line on earth. It is a big proud profession, the reason I say "Profession," is because some of us profess to know all about it, and at the same time make a shameful sideline out of it. Beekeeping as a hobby is different from beekeeping as a sideline. The man that keeps a few colonies as a hobby is wise, he is oftentimes our best informed, and studious and diligent beekeeper. While the sideliner is afraid to venture, he wants to split his mind and hold two jobs. He has never thought of the possibilities of beekeeping. He sells his little crop and lays down on the job until he gets another crop. He never considers that the selling of honey at a profit of 100 per cent is a good part of the business. The wholesale price just now is about eight cents,

the retail price is from 15 to 20 cents. A man that is not satisfied with such a profit should run a skunk farm and sell odors.

By far the largest part of beekeeping is the selling of bee products. The same grade of honey should be furnished at all times. Granulated honey should be advertised along with the liquid honey. It might surprise some to know that twenty per cent of your customers prefer honey that is candied. If all, or even one-half of our sideliners would drop other things, and go into the bee business, the marketing problem would soon be settled.

The attention of people would be attracted more and more to honey as a staple. Thousands more would eat honey, if every beekeeper would do his part in advertising honey. And if every local newspaper had a honey ad each week, it would do more good than all other so-called national advertising. Don't be scared out by the cost, like the lady that wanted to advertise for her runaway husband. The editor told her it would cost $2.00 per inch. She said she wouldn't advertise as her husband was over six feet long. The usual price in local papers is ten cents per line, depending on the circulation. An ad in a farm paper that has a wide circulation is fine. Farmers, when they eat honey, eat lots of it, many want a sixty pound can. Ten pound pails can be shipped by Parcel Post by putting three drops of solder on the cover to hold it secure. The address is put on and the pail sent naked, without a box.

Beekeeping is a comparatively new business, so is selling gasoline. But gas, and gas dealers along with customers all came in at about the same time. Gas helps sell honey along the highways. Gas is a necessity. Honey is a luxury, because of the price and its scarcity. Other sweets that complete with honey are plentiful and cheap. The supply governs the price and the price governs the demand. When the production of honey becomes better known and better established, there may be a market value the same as eggs. Eggs and other farm products vary from day to day, if eggs are fifty cents and beef steak forty, people will go after the steak. If steak is fifty and eggs forty, they will eat more eggs.

If honey could be produced at the same price as sugar, people would eat more honey. As it is now, honey prices are just what the producer thinks he can sell it for. The production and selling of honey must naturally be expected to do business the same as other lines of business. The man that can produce cheaper can sell cheaper. Price cutters get raked up the back many times, but bee men are not the only price cutters. Stores that sell clothing and groceries are continually at war in price cutting, and they make less fuss about it than we beekeepers. It is part of the game for all products that have no established market value.

Honey is a life saver, a health giver, and should be advertised for what it really is. A small amount of honey is good for us, but a large amount is injurious. A tight wad asked me one day, "What's the matter with your honey?" I told him "I didn't know anything was the matter with it." "Why?" "Well," he said he ate some at a neighbor's the other day and it almost killed him. I asked him how much he ate. He said about a teacupful. People that are not used to it should be told about

the good qualities if not eaten to excess. If a customer gets an over dose, you probably have lost a customer.

A railroad president was asked how to make a success in business. He said, "Late to bed, early to rise, work like 'll and advertise." Advertise and your business will grow, take the ad out, and your business will be slack. Individual advertising pays. If it is to sell wholesale, advertise in a Bee Journal. If it is for retail, advertise in your locals or in Farm Journals.

If you want to keep the price up, you will have plenty of help. Call on the poor beekeepers, many of them are helping you. Gasoline along the highways is a big help. But the stinger does more good than any point I know of. Timid folks, the ones that probably eat too much rabbit are kept out of the bee business. Poor salesmanship helps the one that is not too timid. Whoever saw a first class "timid" salesman? Get it in your mind that one man is just as good as another and frequently a heap better, but the better one is yourself. If you believe it, it is true. The point is that you must have faith in yourself or you are a dead duck.

Some folks seem to think there is nothing much to learn about bees, that all you have to do is to rob them each fall. I was told a story about a man that had failed in everything he had tried, finally he got sick and was taken to the hospital. The doctors decided to operate and removed his brain, when they were making an examination of his brain, he jumped up and ran away, leaving his brain at the hospital. The next time they heard from him, he was down in Texas and had gone into the bee business. The doctor offered to send him his set of brains, but he wrote back that he didn't need them. We have all seen beekeepers that had probably been operated on. But many have not and seem to get along just about as well without the operation, but it always seemed to me that a few brains would come in handy when we wanted to sell our crop. On the other hand if we had none we would not worry about selling it.

I don't know whether or not a bee has brains, but he has some other attachment that is useful. The bee business would not last without the bees. And right here I want to emphasize the fact that every man who is engaged in the business should know as much as possible about bee disease. It is a part of the game. Everyone should help keep the neighborhood clean. This is one part of the business that requires cooperation in the strictest sense. Let the price and other things go, but help your neighbor keep clean. The shipment of honey from diseased apiaries from one state to another should be prohibited by the Federal Government. Nothing affects beekeeping as much as the fear of disease. Bee men will not expand their business on account of it. Disease in the beeyard makes the cost of production more, and is very discouraging to say the least.

I will say in conclusion that this paper is just one advice after another. All papers and speeches are the same. We beekeepers have been giving advice ever since we knew anything about bees and some of us many years before. This paper is the very best I could write. If any one can do better it is because he knows more.

THE CORRELATION BETWEEN THE WORKER BEE AND THE WORKER CELL.

(Ulysses G. Stanley, Nisbet, Pennsylvania.)

The beekeeper is engaged in the production of the greatest food article in the world or honey; and it is not only necessary for him to know something about the product, but it is equally, if not more, important to learn all he can about the bees that produce it, for it is clearly evident that the success in the production of a superior grade of honey depends in large measure on his knowledge of bee behavior. A writer in a recent number of The Beekeepers' Item believes that the big problem of the beekeeper to-day is honey production rather than honey selling, from the fact that so much is being done at present to popularize honey, and shows the importance of increased knowledge in this direction.

It can be truthfully said that as yet we know very little about the honeybee (Apis mellifica L.). They have been studied from the time of Aristotle, before the beginning of the Christian era, down to the present and it is still not definitely known whether or not they are in any way capable of being affected by sound.

There is a distinct correlation between brood rearing, comb building and honey gathering. When nectar secretion begins, brood rearing and comb building begin, and when the honey flow ceases, brood rearing and comb building soon cease. However, Merrill while at the Kansas station pointed out in the American Bee Journal, that there is no correlation between the color of the queen of a colony and the amount of honey they will gather.

It has been stated that about fifteen per cent drone comb is built by newly hived swarms where no foundation is supplied. It may frequently run as high as thirty per cent. We have seen frames with so much drone comb that they were of little value for brood rearing.

The combs of some sections in comb honey supers will be built of worker cells and in other sections drone cells will be built. The combs built of worker cells are the strongest, and have a better appearance when filled with honey and sealed, than combs built of drone cells.

The older a queen the more drone comb is built. A colony with a newly mated queen rarely, if ever, builds drone comb. So the importance of having prolific young queens in the hives is here seen.

Several years ago we began a study of the correlation if any, between the worker bee and the worker cell: for it is obvious that if there is a correlation between them, it is certain that when the right condition is present in comb building, all worker cells will be built without the use of full sheets of comb foundation.

It is a clearly established fact that bees always build the worker comb first or next to the top-bars, and the drone comb second or at the ends and bottom of the frames. They also frequently build small groups of drone cells about half as large as the hand in the center of the frames.

It has been found that there are dominant and recessive characters in the embryonic development of the bee, and they are likewise present in the larval stage and known as an arrested development, in which the recessive development rests while the dominant is being developed. The dominant and recessive characters are also found in the adult, for it seems altogether probable that what the bee does in the embryonic stage, it does in a similar manner in active life. In fact it is evident that the active life is determined in the brief embryonic development. It is therefore apparent that the worker comb is built by dominant comb builders and the drone comb by the recessive comb builders.

Cheshire, Cowan, Cook and others have shown that in the wax makers, the wax secreting glands, or System No. 3 of Cheshire, are larger at the beginning of the comb building period when the worker cells are built than later when the drone cells are built. In fact it has been found that these glands gradually become shrunken with age and are completely atrophied in old bees. So the secretion of wax is more abundant in the dominant period than in the recessive period. It may be well to state here that the dominant workers are younger than the recessive workers, for the recessive period immediately follows the dominant period, and building drone comb is probably among the last inside work before they begin work in the fields.

The great Huber, and later Dr. Bevan of England, were probably among the first to find two kinds of bees employed in the hive or nurses and wax makers, and they point out that while there are often thousands of them present, they never encroach on each others labors.

In forming the festoons in building the base of the comb, the dominant or worker comb builders are always suspended first from the top-bars of the frames, and the recessive or drone comb builders are next suspended from the dominant builders. The dominant and recessive comb builders are each grouped in the festoons by themselves for the physical conditions of the two groups are different, so that dominant comb builders cannot build drone cells; nor can recessive comb builders build worker cells. In fact the recessive comb builders are only called upon to assist in forming the festoons when there are not sufficient dominant comb builders to fill out the space. So it naturally follows that where there are sufficient dominant comb building bees to form complete festoons in the frames, there will be only worker comb built.

There are other factors leading to the dominant and recessive activities of the honeybee, but it would be beyond the scope of the present paper to make mention of them here.

In order to insure having worker comb built, it is necessary to hive or shake the bees in small hives so the festoons in the frames can be filled out by dominant comb builders, for when the recessive comb builders are not needed in forming the festoons, they invariably yield in favor of the dominant builders. The hives should be sufficiently small so the inside space can be well filled with bees.

With this end in view we purchased ten, five-frame hives from the A. I. Root Company about ten years ago for hiving the swarms. These hives are also of convenient size for one person to move from one place to another in the apiary. We have used both first and second swarms for comb building depending on their size with one inch medium brood foundation in the frames in order to secure straight combs. After-swarms are the best comb builders for they are largely composed of young bees about the same age.

The results in building worker comb in these small hives have been surprising. We have secured frame after frame with the comb built down to half an inch of the bottom-bar and every cell in the frames of worker size.

The number of worker cells in the comb is a fair index of the number of bees in the dominant comb building group when they were built.

There is also a correlation in numbers between the organs of the bees employed in comb building, and the wax scales used in building the base of the worker cell, but a detailed account of this is material belonging to another paper.

As soon as the space is enlarged in the comb building operations, they begin to build some drone comb. On one occasion some years ago a partly filled frame of worker comb was removed from one of these small hives and placed in a ten-frame hive, and it was soon filled out with drone comb.

In a similar manner worker comb is mostly built in nuclei because the recessive comb builders are restrained from building drone comb, and the scales of wax may often be seen in the wax pockets on the ventral or lower surface of the abdomen; they may even vie off to the fields for honey with these scales still in their wax pockets as many have observed.

Where a colony has more recessive than dominant comb builders, it frequently occurs that rather than build drone comb they will cease comb building operations entirely until more dominant comb builders can be reared.

From the above it is seen that the reason worker cells are not always built in comb is because there are an unsufficient number of dominant comb builders to perform the work, so the recessive comb builders come to their assistance and finish the comb with drone cells. The same is true of nursing and honey gathering, for the dominant groups are the controlling force of the hive.

The dominant and recessive factors in the adult apply more particularly to the age of the workers than to numbers. This is evident in honey gathering from the fact that in two colonies of equal numerical strength and equally prolific, one will gather more honey than the other. Indeed it frequently occurs that a colony with a less number of workers will gather more honey than a stronger colony, so it is not the number of bees in a hive that is to be taken into account, but the number of dominant bees in the group, whether of nurses, comb builders or honey gatherers. In this connection Merrill states that there are other factors

besides numbers which determine the amount of honey a colony will gather.

The first work of the bee after emergence is nursing, second comb building, and third and last honey gathering. In other words they begin with nursing and end in honey gathering. During a harvest the honey gatherers mostly succumb in the fields.

As there is a correlation between nursing, comb building, and honey gathering, so where colonies are good in one they are good in all three, and where they are poor in one they are poor in all three for, barring accident, they pass from one period to another in regular order.

The combs are completed much faster where only a few frames are being built than where a larger number are started at the same time. The worker cells are also much more uniform in size.

The standard hive made smaller by division boards is not as successful in securing combs built of worker cells as small hives, for when the bees feel crowded they will build comb outside the division boards.

Can queens be bred that will keep the hives well supplied with a predominant number of workers in the three most important phases of bee activity, or nursing, comb building and honey gathering. Although this may seem improbable it is not impossible, for as yet we know little about the possibilities of bee breeding. According to Cheshire, Leuckart, a German investigator, estimates the number of spermatozoa that the spermatheca of the queen will hold at 25,000,000, and probably few, if any, mated queens at present ever contain one fifth of this number.

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THE RELATION OF INSECT POPULATION TO THE PRESENCE OF A POLLINATION PROBLEM.*

(Ray Hutson,** New Brunswick, New Jersey.)

The present day agitation over the use of bees in orchards to effect pollination has come about without any wide recognition of the conditions which have made it necessary. Certain findings, made in the course of the investigations at the New Jersey Agricultural Experiment Station, indicate that a shortage of natural pollinating insects, such as bumblebees and their relatives, exists in areas where pollination problems are most acute.

A summary of the results of our collections made during the blooming period in southern New Jersey, where a distinct pollination problem exists, and in northern New Jersey, where there is no pollination problem, is shown in the following table which is the average of one hour collections made over a period of six seasons in the designated localities.

Average Number of Pollinating Insects Collected Per Hour on Apple Flowers in New Jersey.

	Bees.	Flies.
Southern New Jersey	5	11
Northern New Jersey	78	2

The figures presented in this table indicate that the number of insects which might effect pollination in southern New Jersey is extremely small while the population of the same kind of insects in northern New Jersey is much larger. These figures, when considered with the fact that orchardists of southern New Jersey get a large increase in amount of fruit set when honey bees are put into their orchards and the fact that the orchardists of northern New Jersey do not get as large an increase from the same practice, seem to show a relation between the population of insects other than honey bees and the existence of a pollination problem.

If we consider the types of orcharding practiced in the two places a possible reason for the difference in population is apparent. In southern New Jersey fruit growing is confined to certain districts. Large plantings are the rule and clean cultivation is practiced. In northern New Jersey orcharding is not practiced so extensively. In fact most orchards are small sod plantings on general farms with an abundance of pasture and woodland about them. These conditions provide more

* Paper of the Journal Series, New Jersey Agricultural Experiment Station, Department of Entomology.

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and better breeding and overwintering places for insects than are found in southern New Jersey. The applicability of the preceding statements to the presence or absence of pollinating insects at blooming time is better understood if we remember the life histories of the commoner flower visiting insects other than the honey bee. If the honey bee is excepted, the only insects available for pollination at the time when fruit blooms are the overwintering forms of the various bees and flies concerned. In the case of the bumblebee, which is typical of the various flower visiting bees concerned, only the fertilized queens go into the winter and but a small proportion of those going into the winter are available the following spring for working on flowers. The same general statement applies to the flies. If there are few breeding and overwintering places available the number of flower visiting flies available at blooming time is cut down.

These conditions furnish an explanation as to why no pollination problem existed in the small plantings of early days which were surrounded by large areas of waste land in which pollinating insects bred and overwintered. Formerly, too, orchards were not subjected to the clean cultivation now practiced with a consequent destruction of breeding and overwintering quarters in the orchard. These circumstances in the aggregate account for the disproportion between the number of pollinating insects and flowers to be pollinated now existing in many fruit growing areas.

ROADSIDE HONEY SELLING.

(M. J. DEYELL, Medina, Ohio.)

My first experience in roadside honey selling occurred during 1917 and 1918, while engaged in commercial beekeeping in the wild raspberry region of northern Michigan. That was during war time, when sugar was mighty scarce, in fact, we had to pay thirty cents a pound for it, and could buy one and one-half pounds of it at a time. Being in the honey business, we banished the sugar bowl from our table. Our home apiary was about a third of a mile from the main highway, on a side road, little travelled. In fact, we were up in the sticks, near the jumping off place.

One day, a fellow came along with an empty bucket to get some honey. Evidently he told his friends and neighbors about it, for, in a few days, people began to come after honey. A grocer from the neighboring town drove up, and said that he would take all the honey we had. At that time, we had about five thousand pounds of extracted honey in sixty pound cans in cases, piled up in the apiary house. The grocer ended up by taking home one sixty pound can. He had no idea how much honey we had on hand, and we did not take the pains to enlighten him. We sold considerable honey locally. In fact, at one time, I had so much money in the pockets of my jeans, that I had to make a special trip to the nearest town to deposit it in a safe place. This may sound fishy, but it is absolutely true.

In the fall of 1918, the white honey brought 22 cents a pound, and buckwheat honey 20 cents per pound, f.o.b. our station.

Times have changed. At present sugar is so cheap and plentiful, that honey has to be pushed forward and called to the attention of the public before it receives the consideration that it rightfully deserves.

I read recently in a book on Marketing and Merchandising, that there are only two ways in which anything can be sold,—by personal salesmanship, and by advertising. It seems to me that both of these methods can be used to good advantage in roadside honey selling.

But before any product can be sold to advantage, whether it be pins, threshing machines, or elephants, the salesman must do four things: *study the product, study the market, find the selling points and reach the market.*

STUDYING THE PRODUCT.

We must know *what honey is, where it comes from, how it is produced, what kind of a food it is,* whether it is fat, carbohydrate, or protein, and its food value and healthfulness, as compared with other sweets,

whether it is a *necessity or a luxury, the nature of the demand,* and many other pertinent facts.

Studying the Market.

We should know who comprises the market, men, women, or children, the rich or the poor, the size or the limitation of the market, the buying season, how roadside consumers buy honey, whether in large or small packages, in tin or glass containers, the buying habits, whether the roadside market is likely to grow or shrink, the problem of competition, and other points.

Finding the Selling Points.

The things that can be said or written about an article, and that will help the customer to make up his mind to buy, are called selling points. It is obvious that selling points are found as a result of a careful study of the product and the market. What, then, can be said or written about honey that will help customers to make up their minds to buy? There are a number of appeals, but one of the strongest is the healthfulness of honey. We all buy foods that will benefit us. The selfish motive in buying must be appealed to. There are many other selling points that can be developed and used, to advantage, in order to build up and maintain a good volume of sales.

Reaching the Market.

The next logical step to be considered in the market to roadside selling is a good location. The merchant in the town or city picks a good site for his store, where many people pass by, so the roadside honey seller must be located on a well travelled road. A corner or intersection of roads, a bend in a road near a gasoline station where autos have to slow down a bit, are good places to establish honey selling stands.

The dwelling house, gas station, or wherever the honey is being sold, should be well kept up, and should look spick and span.

Honey Signs.

It is quite necessary to have at least one attractive honey sign, with the word "Honey" in large letters. It is an advantage to have some suitable appeal for the use of honey, where it can be easily seen. If the honey stand is located on a straight road, where autos travel at a high rate of speed, it is an advantage to have a sign at either side of the honey stand, to announce the stand to autoists before they get to it.

It seems to be an advantage also to have a bee hive with some supers on it, well painted, to add attractiveness to the surroundings. The cover of the bee hive makes a good place for some sample pails or jars of honey. A bee hive seems to have the effect of helping to convince the prospective customers of the purity of the honey.

Attractive Packages.

Roadside honey stands should have honey for sale in both tin and glass containers. The glass shows off the honey to good advantage and makes an appeal to those who do not know much about the product. The attractiveness of honey in glass starts many new customers who buy it in larger tin containers later. Honey in tin containers appeals to tourists on account of safety in transportation. Comb honey should be displayed under glass. It is an advantage to have comb honey cartons ready to put combs into when sales are made. They are convenient and sanitary. Attractive labels for packages can be easily secured. They add greatly to the appearance of the honey.

Honey Prices.

Prices should be in line with the law of supply and demand and should, under no consideration, be exorbitant or unreasonable. A 5-pound pail of white honey for $1.00 seems a reasonable price. Seventy-five cents for a quart jar of honey is not exorbitant. It is an advantage to have prices of the most popular packages announced on a sign, so that prospective buyers may know, without asking, whether or not the price of the honey is within the range of their pocketbooks. Quite often a customer not knowing the price will hesitate about inquiring because of feeling obligated to buy, after making the inquiry.

Quality.

In order to build up an increasing volume of honey sales, a high standard of quality must be maintained. The color and flavor of the honey should be kept uniform so far as this is possible. Due to the differences in seasons, weather conditions, and bee pasturage from year to year, it is indeed difficult if not impossible to have honey that is always uniform in flavor and in color. Honey gathered from the same locality may be different in flavor and color from year to year. During a season unfavorable for honey, the quality may be decidedly below standard quality. Honey that is off grade, poorly ripened or honey which may have a decidedly unpleasant flavor should be sold to bakeries. The roadside seller should buy good quality honey from some reputable beekeeper to supply the market.

For the benefit of those who wish to purchase dark honey as well as light, it pays to have two kinds on hand. A diversity of flavors and colors however, adds to the labor and cost of stock keeping.

Sampling.

This is important. Quite often a taste of honey makes a sale and a steady customer. Clean sampling sticks should be kept in a clean white pasteboard box with a dust proof cover. The sampling jar should at all times look clean and appetizing. It is an advantage to have some wafers to go with the samples of honey. In the case of prospective customers who are a little doubtful regarding the quality or purity of the

honey, it is a decided advantage to have them taste and try before they buy. This simply makes an added appeal to the sense of taste as well as to the eye.

Advertising.

Some roadside sellers are using folders containing information concerning honey, also recipes for the use of honey in cooking. A folder is attached to each package of honey sold, by means of a small rubber band. This certainly helps to further the use of honey. A classified or display ad in the local paper also helps. It brings honey to the attention of many people who would not otherwise know about its being offered for sale.

Service.

Roadside selling stands should have attendants well versed in honey, how it is made, its food value, in fact, the salesman should be posted with information concerning bees. Beekeeping is such an interesting subject that the interest of any prospective customer can be held until he decides to try out a package of honey. In order to captivate the interest of those who are not sold on the virtues of honey, there is a little trick that can be worked, to hold the attention of the customer long enough for the salesman to tell the story of honey. Take a glass jar of honey and tip it upside down. The air bubble will travel upward. This bubble has the appearance of a balloon. Simply tell the prospective customer that you put a balloon in each jar, for the children to play with. I remember, not so long ago, stopping at a well known honey stand, kept by Mr. George Mapus, of Clyde, Ohio. Mr. Mapus had some honey in two pound jars as well as in tins. A customer had driven up to the roadside stand and had purchased some comb honey and vegetables. I picked up a two-pound jar of honey, tipped it up, called attention to the balloon and soon had the interest of the customer. He said that he had never noticed the balloon before. The result was, he bought the jar of honey. Mr. Mapus said to me afterwards, "Jack, I knew what you were up to when you tipped the jar upside down."

Roadside Selling on a Large Scale.

In order to dispose of a large crop of honey, a chain of roadside stands must be established. In fact, it may be necessary to have a dozen or more stands on well travelled roads. The stands must be far enough apart to be profitable and should be located on different roads if possible. The beekeeper operating the stands is kept busy supplying them with honey and educating the operators of the stands up to the best selling methods, etc. Uusually, the roadside sellers are given a commission on sales.

Roadside honey selling while it has its active season during July, August, September and October, is an all year around proposition and it therefore keeps the beekeeper actively engaged throughout the year. If beekeepers are not logically well located for roadside selling, they can establish selling stands on well travelled roads.

Advantages of Roadside Selling.

While it would be impracticable and impossible to market all of the honey or even a major portion of it, through the roadside selling channel, this method of selling has some distinct advantages to the beekeeper and to the industry as a whole.

No. 1. It gets the honey direct to the consumer quickly before the honey has a chance to do much granulating.

No. 2. It avoids complex marketing problems.

No. 3. It increases consumption of honey through other channels because of its being brought to the attention of so many people who travel along the highways.

The attractive roadside honey stand of A. E. Meinecke of Arlington Heights, Illinois.

No. 4. It enables the producer to dispose of his crop conveniently at a profit.

No. 5. Any food and especially honey, offered for sale in the country, makes an appeal to the customers because of its freshness and purity.

No. 6. Roadside honey selling is a cash business and helps to eliminate bookeeping and collections.

To be successful in selling honey, one must really and truly believe in honey and be fairly saturated with the principles that govern success. Unless one eats honey, thinks honey, dreams honey, and sells honey with all his might and main he had better look for an easier job.

COMPARATIVE METHODS OF MANAGEMENT.

(V. G. MILUM, Champaign.)

It seems to be a quite prevalent opinion among Illinois Beekeepers especially for the southern two-thirds of the State, that winter protection is not necessary for colonies of bees. On the other hand there are those that advocate some winter protection even for localities as far south as the southern third of Illinois. In the past few years certain records have been taken at the University of Illinois apiary at Champaign, Illinois, which are related to this subject. While Champaign is approximately 125 miles directly south of Chicago, it must be admitted there is no doubt considerable difference between this locality and that of southern Illinois.

One may find many articles in the bee journals, stressing the value of winter protection, but no attempt will be made to review these in this paper, but our observation will be given for any help that they may show in regard to this much discussed subject.

TABLE I—WINTER LOSS OF WEIGHT, 1926-1927.

Number of colonies.	Type of protection.	Weight loss, Nov. 4-Mar. 31.	
		Variations.	Average.
23	Quadruple cases	12.5-38 lbs.	23
*12	Quadruple (reduced tunnels)	15 -30	24.3
*11	Quadruple (deep tunnels)	12.5-38	21
2	Double-walled	14 -15	14.5
4	Celotex	11.5-21.5	17
3	Unprotected	19 -27	22

* NOTE.—These two groups are the same as first group.

Table I gives the loss of weight in colonies for the winter period of November 4, 1926, to March 31, 1927, for colonies wintered with various types of protection. We have not indicated "loss of weight" as "stores consumed" since there is no known way of exactly determining the weight of honey stores displaced by young bees and brood in the process of development at the time of season when lost weights were obtained. In our opinion there is no doubt but what the better protected colonies have actually consumed less stores for the winter period, but on the other hand, the additional loss of weight has been supplanted by valuable bees ready to help build up the colony to maximum strength in time for the main honey flow.

The type of protection given in the 1926-1927 records is shown in Table I, the quadruple cases being of the Iowa type which provide 6

inches of packing (shavings) on the sides, 4 inches below, and 10 inches on top. The part of these colonies with larger tunnels actually lost less weight than those with reduced tunnel entrances which probably used more in producing bees.

The double-walled hives were provided with the usual packing tray. The Celotex was of double thickness fastened to the hives by wooden clamps. The entrances of the unprotected colonies were reduced by the ordinary triangular entrance blocks. None of the hives were given any upward ventilation which is much stressed by many beekeepers as one of the essentials of good wintering.

The number of colonies weighed for the winter of 1926-1927, especially in the latter methods may not be large enough to be significant, but a greater number of colonies were included in the results for the winter of 1928-1929 as indicated in Table 2. The type of protection was similar to that described and used for the winter of 1926-1927 except that the Celotex cases were made to telescope down over the hive fitting tightly against it. The regular metal cover was laid on top of the telescope case. The size of the entrance at one side was ½ by 2¼ inches.

For the winter of 1928-1929 all colonies were weighed on November 15 and then at successive periods during the winter depending on the amount and type of packing. These weights, including minimum, maximum and averages for each method of wintering are given in Table 2.

TABLE NO. 2—WINTER LOSS OF COLONY WEIGHT, 1928-1929.

Winter protection.	Nov. 15-Jan. 30, 76 days.	Nov. 15-Mar. 2, 97 days.	Nov. 15-Mar. 18, 123 days.	Nov. 15, Apr. 2, 138 days.	Nov. 15-Apr. 17, 153 days.	Nov. 15-May 25, 191 days.
None	10 (5⅛–9⅜) 6.71	10 (8⅞–15⅜) 11.05	10 (11¾–21) 16.09	10 (13⅛–26) 18.8	10 (13¼–29⅛) 20.6	10 (16¾–37½) 27.0
Double-walled (Buckeye)	3 (5⅜–7) 6.0	5 (6¾–11⅜) 9.05	5 (11¾–13¾) 12.75	5 (13¼–16½) 14.45	5 (14–20⅜) 16.57	4 (20⅜–27⅛) 22.84
Celotex	(Removed March 18)	----------	13 (12–19½) 14.87	13 (11⅝–20⅝) 16.86	13 (11⅞–24¼) 19.24	13 (17¼–41¼) 27.64
Iowa packing case (quadruple)	(Removed April 16)	----------	----------	----------	21 (16¾–34⅞) 22.51	12 (20⅜–39½) 30.14

NOTE.—The figures preceding the parentheses indicate the number of colonies weighed. The figures within the parentheses indicate the minimum and maximum consumption in pounds of honey. The lower figures of each group indicate the average consumption for the period.

The writer was somewhat surprised to find the low consumption of stores during the early part of the winter and also to find so little difference between the unpacked and the protected colonies during this same early period. Beekeepers who have been asked to estimate the amount of loss for the 76-day period have in general all given estimates double the actual consumption while some have guessed as high as 30 pounds for the unprotected colonies.

It may be said that for the locality of these colonies, the bees obtained frequent good flights after the middle of February and pollen was first carried in from soft maples on March 13, 1929. This means that

for the months of March, April and May the records are complicated by the use of stores for broodrearing, the exchange of this type being greater in the heavier protected colonies for the early spring.

It has been our observation that protected colonies always are stronger in bees and have more brood by the fruit blooming period than do colonies wintered with no protection. However, toward the latter part of May and early June a strong unprotected colony may have as much or more brood than colonies showing a larger brood nest earlier in the spring. In cold wet springs with a late honey flow, as in 1927 for this locality, weaker colonies may even build up to fair strength by the main honey flow and store a good surplus. With an early honey flow the better protected colonies will show more favorable results as far as surplus production is concerned.

From the results of previous use of the Celotex cases we were about convinced that they were not so desirable as we had them constructed. For even when painted with sublime blue lead mixed with linseed oil we found that they were great absorbers and retainers of moisture. Perhaps some top ventilation should be provided but without it many colonies were found with moldy combs and with piles of moldy bees below the cluster on the bottom board. That the wet Celotex was not a good insulator is also shown by the amount of loss of stores in the Celotex protected colonies, being almost as great as with no protection. We are trying them again with a layer of roofing paper to keep the Celotex dry. The results should be more satisfactory.

Mr. J. C. Baines of the Research Department of the Celotex Company under date of March 7, 1930 has suggested that proper ventilation be provided to remove the moisture that accumulates on the inside of the hive. Perhaps some form of upward ventilation for these telescope Celotex covers can be provided. However, they must be kept dry to keep cold temperatures away from the wall of the hive which causes condensation of moisture on the inner wall. We do not have that trouble with double-walled hives and those packed with six inches of shavings or leaves.

For the information of those who may want to experiment with Celotex for bee hive insulation, we take the liberty of quoting from Mr. Baines' letter as follows:

"We might mention that for protecting the Celotex surface on the inside of the hive, we suggest a coat or two of either wax or paraffine, also shellac may be used with good results. When Celotex is used on the exterior, the surface should be properly glue sized with a mixture of one-half pound of glue to a gallon of boiling water and then subsequently coated with two good coats of lead and oil paint. This protection will amply protect the Celotex from the weather and should prove a durable and a lasting finish."

Now let us turn to the production records of these same colonies wintered with various types of protection in 1928-1929. As given in Table 3 to 8 inclusive we have allowed each colony the same amount of stores for the 1928-1929 winter period and have considered surplus stores as the honey produced above an additional 40 pounds for the

winter of 1929-1930. In other words each colony was loaned 40 pounds or more of stores in 1928 but had to pay it back in 1929. Records were not kept of the amount of drawn combs or foundation given the various colonies but in general all received drawn combs until the supply was exhausted after which foundation was added but generally not more than one super of such except in the case of the colonies listed as being divided and later reunited. Variations in individual colony total production may in part be due to these differences but the averages are probably very little affected.

TABLE NO. 3—NO WINTER PROTECTION, 1928-1929.

Colony No.	Queen record.	Type of hive.	Weight, Nov. 15-Apr. 17.	Loss, Nov. 15-May 25.	1929 surplus.	Remarks.
27	?	Standard	27	34	Comb	
49	1928	Standard	17	30	Comb	
53	1928	Standard	13	17	Comb	
54	Carniolan 1928	Standard	17	21	Comb	
7	Carniolan ?	Mod. Dad. + Mod. Dad.	29	38	48	Swarm 5/16/29 virgin 5/28. Drone laying queen, Oct. 1929
40	1928	Standard	15	22	61	Colony very weak.
20	1928	Standard	19	29	115	
22	1927	Quinby	25	19	100	
24	1928	Standard	26	34	91	
43	1928	Mod. Dad.	19	30	160	

Average of last 5 colonies, 105 pounds.
Average of last 4 colonies, 116.5 pounds.

TABLE NO. 4—CELOTEX TELESCOPE WINTER CASES, 1928-1929.

Colony No.	Queen record.	Type of hive.	Weight, Nov. 15-Apr. 17.	Loss, Nov. 15-May 25.	1929 surplus.	Remarks.
34	?	Standard + Shallow	20	33	10	Swarmed.
39	1928	Mod. Dad. + M. D. Super	23	19	48	Swarmed previous to 6/11/29. Eggs given.
2	1928	Mod. Dad. + M. D. Super	24	36	69	
23	?	Mod. Dad. + M. D. Super	17	19	93	
8	1927	Mod. Dad. + M. D. Super	23	34	120	
14	1927	Mod. Dad. + M. D. Super	23	41	126	
19	1928	Mod. Dad. + M. D. Super	12	19	162	
21	?	Mod. Dad. + M. D. Super	15	28	122	
41	1927	Standard + Shallow	22	24	131	
52	Carniolan 1928	Standard + Shallow	13	21	116	

Average surplus of last 8 colonies, 117 pounds.
Average surplus of last 6 colonies, 129.5 pounes.

TABLE NO. 5—DOUBLE-WALLED HIVES, 1928-1929, WINTER CONSUMPTION OF STORES, 1928-1929 AND PRODUCTION, 1929.

Colony No.	Queen record.	Super.	Weight, Nov. 15-Apr. 17.	Loss, Nov. 15-May 25.	1929 surplus.	Remarks.
32	1927?	None	16	27	83	4/29/29 brood spotted.
1	1928	Shallow	16	20	156	
26	1928	None	14	----------	150	
33	1928	None	17	23	130	
38	1926-27?	Standard	20	22	101	

Average surplus of 5 colonies, 124 pounds.
Average surplus of 4 colonies, 134 pounds.

TABLE NO. 6—PACKED IN LONG QUADRUPLE CASES, 1928-1929.

Colony No.	Queen record.	Type of hive.	Weight, Nov. 15-Apr. 17.	Loss, Nov. 15-May 25.	1929 surplus.	Remarks.
6	1928	Quinby + Shallow	22	39	United	Laying worker 6/14/29.
17	1927	Mod. Dad. + Super	28	34	United	Queenless in June.
5	1928	Mod. Dad.	20	24	82	
47	1928	Mod. Dad.	24	34	40	
3	1927	Mod. Dad. + Super	24	30	182	
35	1928	Mod. Dad. + Super	18	34	148	
37	1928	Mod. Dad. + Super	20	32	163	
48	1927?	Mod. Dad. + Super	19	?	171	
45	1927	Mod. Dad.	19	22	166	

Average surplus of last 7 colonies, 136 pounds.
Average surplus of last 5 colonies, 166 pounds.

TABLE NO. 7—DIVIDED AND REUNITED COLONIES, 1929.

Colony No.	Queen record.	Weight, Nov. 15-Apr. 17.	Loss, Nov. 15-May 25.	1929 surplus.	Remarks.
10	1927	20	43	290	Divided 4/18/29 to 6/18/29.
11	1928	22	38	182	Divided 4/18/29 to 6/18/29. Queenless, Sept. 1929.
12	1928	17	33	277	Divided 4/18/29 to 6/18/29.
15	1927	30	34	217	Divided 4/19/29 to 6/19/29.
18	1927	29	46	234	Divided 4/19/29 to 6/19/29.

Total, 1,200 pounds; average, 240.

NOTE.—All colonies wintered 1928-1929 in Modified Dadant hives without supers packed in long quadruple cases of Iowa type.

Colonies divided into two portions with 1929 queen introduced to part with majority of sealed brood. Old queen removed at time of reuniting divided portions.

TABLE NO. 8—PACKAGE BEE PRODUCTION, 1929.

Three Pound Packages.

Colony number.	Weight of bees.	Stores loaned.	Net surplus over loan and 40 pounds for winter.	Remarks.
61	3 1/8	25	0	Queen not accepted. Colony united.
62	3 5/8	21	35	
63	3 3/8	27	85	
64	3 1/4	37	9	
65	3 3/8	38	16	

Total 4 colonies, 145 pounds; average, 36 pounds.

Two Pound Packages.

66	2 3/8	36	28	
67	2 3/8	19	27	
68	2 3/8	20	45	Nos. 68 and 69 equalized by shaking after drifting. No. 69 queen balled. Gave 1928 queen.
69	2 5/8	17	85	
70	2 1/4	12	34	

Total 5 colonies, 219 pounds; average, 44 pounds.

NOTE.—Packages installed Apr. 18, 1929 (except No. 70 on Apr. 19) on supers of honey, below Modified Dadant bodies with foundation. Queens introduced in mailing cages.

TABLE 9—1929 EXTRACTED HONEY PRODUCTION.

Winter protection.	Colonies averaged.	Production limits.	Average pounds surplus.
None	5	61-160	105
(Less 1 weak, 61 lbs.)	4	91-160	116.5
(Not averaged, 4 combs; 1 swarmed, 48 lbs.)			
Celotex	8	69-162	117
or	6	116-162	129.5
(Less 2 at 69 and 92 lbs.)			
(Not averaged; 2 swarmed, 10 and 48 lbs.; 2 comb; 1 experimental.)			
Double-walled	5	83-156	124
or	4	101-156	134
(Less one with spotted brood-poor queen, 83 lbs)			
Quadruple Case	7	40-182	136
or	5	148-182	166
(Less 2 at 40 and 82 lbs.)			
(Not averaged; 2 queenless in June; others, comb honey.)			
Quadruple Case	5	182-290	240
Special—(Divided April 18, reunited June 18).			
3-lb. package	4	9-85	36
2-lb. package	5	27-85	44
(Packages installed April 18 on supers of honey below bodies of foundation.)			

A summary of Tables 3-8 is given in Table 9 which does not include as many colonies as were included in the previous winter records of Table 2, but as noted in the table for each type of wintering. Some colonies were used for other purposes as comb honey production, some colonies swarmed, some were weak or queenless and hence not considered as producers but united to other colonies not herewith included.

Straw-packed colonies in the apiary of Hyde Brothers at New Canton, Illinois.

Table 9 tells the story very well and indicates that additional protection is of value even as far south as Central Illinois, although the value of the Celotex and double-walled hives so far as additional production of surplus is concerned may not be sufficient to justify the additional expense. A larger number of colonies considered over a period of years would no doubt give more truly comparative figures.

On the other hand the colonies provided with six inches of packing as in the quadruple cases which were removed on April 17, long before necessary, show an increased production which would seem to justify the additional expense of the packing case. The extra amount of labor involved in packing, unpacking and storing materials is the questionable point in this type of wintering. If the same amount of protection could be given in an easily operated case, the additional costs would be well worth while. One thing we are sure of and that is that our heavily protected colonies are always stronger as a whole in the spring than those with less protection. At the middle of April, 1929, all colonies in quadruple cases that were examined showed from 7 to 11 frames with brood in the Modified Dadant brood chambers with some brood in the supers. Practically every such colony had more bees than three times, (estimated) the average full weight three pound packages received on the same date. (Does it pay to buy package bees?)

But let us turn to the colonies that were wintered in quadruple cases (Table 7) and divided on April 18, that date being chosen because of its being about the average beginning of the apple blooming period over a period of fourteen years for this locality. No attempt was made to choose the strongest colonies, the five used being conveniently located in two of the six quadruple cases. As nearly as possible the brood and bees were divided into two equal portions, a new queen being introduced into the portion with the most sealed brood. The new colony was placed on a separate hive stand near the parent colony. The stores in the super were divided and some additional added if needed but charged to the production records.

Two months later on June 18, these colonies were again united, by the shaking method, the old queen being removed and the young queen caged in the ordinary mailing cage for re-introduction. As for the results, the average production, as shown in Table 2, was double that of colonies wintered without packing and not divided. For colonies wintered with heavy packing, the average increase was 74 pounds of extracted honey or 45 per cent increase. The best of all the other systems of management only equalled the production of the poorest of this lot, 182 pounds, in spite of the fact that the latter was found to be queenless in September.

These increased results would seem to justify the extra manipulation at the beginning of the year especially on years of good honey flows. A similar experiment was tried in the spring of 1928 but the additional surplus did not justify the time and labor involved. Six divided colonies averaged 44 pounds, 13 additional in packing cases gave an average of 29.5 pounds, 4 in double-walled 27 pounds and 9 in Celotex giving 12 pounds average, all colonies being considered in the averages although some actually lost stores and had to be fed in the fall, due to an extremely poor season.

This division and reuniting system is to be tried again and it is hoped that other beekeepers may try the system. An attempt will be made to reduce the amount of manipulation by leaving the two portions on the same stand but providing a top entrance for the division having the newly introduced queen. This should facilitate reuniting the colonies at the beginning of the honey flow. An advantage in addition to increased surplus not mentioned is that the colony is requeened early in the year before supers begin to stack up. The method will probably successfully control swarming. None of these colonies so manipulated made any attempts to swarm so far as we were able to observe.

There are other things to be learned from the results given in these tables. Above all things our systems of management should strive to eliminate the poor and non-producing colonies. They reduce the total profits because of loss of labor in management and the non return from capital invested in equipment.

If one considers the production records of these colonies from the standpoint of the age of the queens, some interesting points are observed since some two year old queens headed colonies that gave greater surplus than colonies with one year old queens similarly managed. The

reader may draw his own conclusion but is urged to consider each group as a whole in passing judgment.

The record of package bee colonies is also given in Table 8. Each was installed at the beginning of apple bloom on supers of fall honey below a body of foundation. The spring conditions were unfavorable for gathering of nectar and pollen from fruit bloom and dandelion which greatly retarded these colonies. The amount of surplus does not seem impressive but this is that received over an additional 40 pounds allowed for winter stores and that consumed in drawing out the combs of the eleven frame Modified Dadant body which is a material gain. These package bees might have done just as well if received at the beginning of the main honey flow. However, it is our contention that in regions of a short summer honey flow and when spring conditions are favorable package bees are best installed at the beginning of the fruit blooming period in spite of the fact that spring feeding may be necessary in cold wet seasons.

For regions with a fall honey flow or with a long extended summer flow or in regions where early pollen is not plentiful, then, no doubt package bees may show favorable results even when purchased at the beginning of the summer flow. As far as having bees for pollination purposes in the orchards, over wintered bees if properly protected and many unprotected colonies if strong in the fall and given good winter stores are more valuable at the beginning of the fruit blooming period than any three pound package of bees. Besides they are there when wanted if ordinary care is exercised in fall manipulation.

HOW MUCH DO HONEY-BEES DRIFT.

(George E. King, Urbana, Illinois.)

Drifting is the term used to designate the casual and peaceable shifting of worker honey-bees from the colony in which they were reared to some neighboring colony. It is seldom if ever attended by fighting or undue excitement, generally taking place without the least indication of protest by the colony into which the drifting bees enter. In such a case the newcomers usually remain as inhabitants of their adopted home, but during some subsequent flight they may again drift into some other colony. Drifting is not peculiar to workers, for drones also drift from colony to colony, and virgin queens sometimes also drift, if their entry into a colony other than the one in which they were reared may be designated as drifting.

From the frequency with which reference is made to it in apicultural writings, its occurrence appears to have been recognized since a very early date. Most often the beekeeper is urged to avoid situating his colonies in any positions, in which drifting is likely to occur. Various reasons are given for this, among which are the undue depletion of weak colonies, the prevention of disease being transmitted from one colony to another, and the desire of the beekeeper to keep each colony as a distinct individual unit.

Notwithstanding the many things which have been written concerning the occurrence and evils of drifting, no one seems hitherto to have made any attempt to secure definite data as to its frequency or extent. Accurate information upon this is desirable not only for the acquirement of information, but it has several important applications in practical apiculture.

Oftimes one colony appears to outyield other colonies near it, and as a consequence the queen in it is selected as a suitable mother from which to requeen the apiary. Naturally she should be a choice individual if she is responsible for the extra showing made by her colony. If, however, many workers reared in neighboring colonies have drifted from them into her colony without an equal reciprocal drifting back to them, the queen can not be credited with the extra results shown by the colony which she mothers. Because of the disappointments which so frequently follow attempts to rear superior daughter queens from such mothers, it may be questioned whether many of the reported exceptional queens do not appear so merely because an unusual number of workers drifted into their colonies and remained there.

Several reasons have been assigned to explain why bees drift. It may be, however, that the basic reason for this seemingly passive and stupid behavior, in which the homing instinct appears to function so poorly, has never been discovered. At any rate much still remains to be

learned as to its causes, its frequency and variation in different races of bees, its influence upon colony yield, and its possible relation to the transmission of diseases from colony to colony.

During an investigation of certain phases of bee behavior in relation to age, by the writer in 1926, the problem presented by the drifting of bees from colony to colony was observed to be of sufficient importance to receive some attention. At the time, numerous workers of known age were domiciled in an observation colony, while other colonies were maintained in other observation hives for the study of other phases of the work being done. Because of the ease with which a marked bee could be seen after it had drifted into another colony the removal of such bees and the recording of the observations was relatively easy.

TABLE NO. 1—RECORD OF DRIFTING OF WORKER HONEY BEES.

Mark used, number and date of introduction of young bees into Colony No. 1.	Date when drifting occurred 1926.	Age when the bees drifted, days.	Number of bees which drifted from Colony No. 1 into the respective colonies during the different days.						Total for all colonies on day.
			Col. 2.	Col. 3.	Col. 4.	Col. 5.	Col. 6.	Col. 7.	
250 bees marked white introduced August 3.	Aug. 8	5	1						1
	" 9	6	1	1					2
	" 10	7	1		1			2	4
	" 12	9		1	9	1			11
	" 14	11		1	2				3
	" 15	12			2				2
	" 27	24			1				1
	Sept. 2	30		1					1
400 bees marked green introduced August 9.	Aug. 15	6		14	4		7		25
	" 16	7	6	1			3		10
	" 19	10		1					1
	" 20	11	3	1					4
	" 21	12		1					1
	" 23	14	1						1
	" 27	18		1					1
500 bees marked pink introduced August 17.	" 21	4	2		1				3
	" 23	6	2	2					4
	" 26	9	8	7		1			16
	" 27	10	3	3					6
	Sept. 2	16	2						2
	" 6	20	2						2
	" 18	32	1						1
400 bees marked metallic introduced Sept. 10.	" 18	8	3		3				6
Total number which entered each hive by drifting			36	35	23	2	10	2	108

The colonies under observation were arranged in a row and bore numbers consecutively from one end to the other. The marked bees were introduced into No. 1, and records were made of all marked individuals found in any colony other than No. 1. The entrance to each of the observation hives was distinguishable by some mark involving both form and color, so that the differences were more marked than is usually the case in a commercial apiary. The intervals between the entrances, when measured from that of No. 1 were as follows: between 1 and 2, 4 ft. 8 in.; and 3, 8 ft. 8 in.; 1 and 4, 12 ft. 7 in.; 1 and 5, 16 ft. 6 in.; 1 and 6, 20 ft. 5 in.; 1 and 7, 24 ft. 5 in. This amounts to

an average of over 4 feet between the entrances of any two hives. All other colonies in the vicinity were housed in standard hives and located at a much greater distance from No. 1. Although some marked bees may have drifted to them it was impossible to check on this, consequently in the records on drifting they were ignored.

The bees used for marking were newly emerged Italian workers. As soon as possible after being marked with a spot of color these were introduced into colony No. 1. Introductions were made on four dates, the first being August 3. Daily observations continued until September 18. The mark, date of introduction, and other data are shown in Table 1.

By computing on the basis of 108 bees as the total (100%) of those which drifted, the percentage of bees which drifted from colony No. 1 into colonies No's. 2 to 7 amounted to: 33.33%, 32.41%, 21.30%, 1.85%, 9.25%, and 1.85% respectively. Although the number of individuals recorded may not be sufficient to admit of a final conclusion on this, these records strongly indicate that there are factors other than the distance of colonies from each other which influence the distribution of drifting bees into them. If distance alone had been responsible we should have expected the per cent of drifting bees to have been divided among colonies No's. 2 to 7 at a rate inversely proportionate to their relative distances from colony No. 1, but the figures given do not approach such a proportion.

Another relation which is of interest, especially from the standpoint of bee behavior, is that of the rate of drifting in comparison with the age of the bees. Because such factors as weather, conditions within the colony, and racial peculiarities, might account for differences between bees of different colonies, it must be borne in mind that the figures given in Table 2 are the results observed under ordinary summer conditions for Italian bees. The days upon which no drifting occurred were for the most part rainy or otherwise unsuitable for regular flights.

Discussion.

Bees younger than four days old did no drifting because that was the youngest age at which they flew outside. Some bees flew out on each day of age beyond the fourth. The breaks in the record on the 13th, 15th, 19th, and other days of their ages were usually due to weather conditions being unfavorable for flights. Additional records would fill in these gaps and help to definitely determine the norm of drifting at each day of age. The ages at which drifting appears to be most prevalent are between the fifth and tenth days. This corresponds rather closely with the age at which the young bees show a tendency to drift from activities within the colony to foraging.

A source of error may enter in computing the rate of drifting at ages beyond that at which foraging is commenced; because as foragers advance in age an increasing percentage of them are lost and the percentage of drift is thereby rendered correspondingly inaccurate. For this reason the calculated percentage of drifting of bees of foraging age, is an underestimate, rather than an exaggeration of this tendency in older bees.

TABLE NO. 2—THE COMPUTED RATE OF DRIFTING OF WORKER HONEY BEES.

Age of bees, in days.	Number of bees of each age marked.	Number of bees which drifted.	Per cent which drifted on each day of their age.	Per cent of drifting; cumulative values on and before day of age indicated.	Approximate proportion of bees which drifted, up to age indicated.
4	1,550	3	0.19	0.19	1 in 500
5	1,550	1	0.07	0.26	" " 387
6	1,550	31	2.00	2.26	" " 44
7	1,550	14	0.90	3.16	" " 32
8	1,550	6	0.39	3.55	" " 21
9	1,150	27	2.35	5.90	" " 17
10	1,150	7	0.61	6.51	" " 16
11	1,150	7	0.61	7.11	" " 15
12	1,150	3	0.26	7.37	" " 14
13	1,150	0	----------	7.37	" " 14
14	1,150	1	0.09	7.46	" " 13
15	1,150	0	----------	7.46	" " 13
16	1,150	2	0.17	7.64	" " 13
17	1,150	0	----------	7.64	" " 13
18	1,150	1	0.09	7.72	" " 13
19	750	0	----------	7.72	" " 13
20	750	2	0.27	7.99	" " 12.5
21	750	0	----------	7.99	" " 12.5
22	750	0	----------	7.99	" " 12.5
23	750	0	----------	7.99	" " 12.5
24	750	1	0.13	8.12	" " 12
25	750	0	----------	8.12	" " 12
26	750	0	----------	8.12	" " 12
27	750	0	----------	8.12	" " 12
28	750	0	----------	8.12	" " 12
29	750	0	----------	8.12	" " 12
30	750	1	0.13	8.26	" " 12
31	750	0	----------	8.26	" " 12
32	750	1	0.13	8.39	" " 12

NOTE:—In column 2—"Number of bees of each age marked" the number 1550 includes all of the bees marked; the 1150 those marked white, green and pink; 750 those marked white and pink; the green having been so depleted in numbers when 19 days of age for other work that they could not be included in further data on drifting.

In the last column of Table 2 the relative frequency of drifting at each of the ages recorded is entered in the form of a proportion. When they were but four days old only one bee in 500 found its way into a neighboring hive. Undoubtedly this is due to the fact that only a relatively small per centage of the bees flew out at this age. By the time they were 14 days old one bee in every 13 had entered the wrong hive. At 32 days of age one out of every dozen or less had found its way into and was accepted as an inmate in some other colony.

Is it possible that drifting is much more general than is usually supposed? What are its advantages and disadvantages? Is it merely the result of an indiscriminate intermingling of young workers from several neighboring colonies during play flights, or might there be some more fundamental reason for its occurrence? In practical apiary management the carefully kept production records of individual colonies apparently may be invalidated because there was drifting of which the beekeeper was unaware. The selection of choice breeding stock may be rendered difficult or inaccurate for the same reason. There are so many factors entering into bee-culture of which so little is known, that more accurate information concerning them is most desirable. One of these factors which offers a relatively unexplored and inviting field for careful investigation is drifting.

HONEY—FROM NECTAR TO FINISHED PRODUCT.*

(A. G. Gill, Chicago, Illinois.)

An Elementary reader which I studied as a boy had a lesson with a verse in which were these words, "The busy little bee gathering honey all the day." The writer of the verse apparently, and my teachers as well, did not know that this line is far from true. Such teaching has continued, and this conception of bee activities has been so wide-spread that it is thought today by many that bees gather honey.

No bees ever gathered a drop of honey as such from flowers. They may in some cases steal it from other hives. Bees gather nectar from flowers and it becomes honey only when it has been modified or changed by them and stored in combs of their making.

I am indebted in preparing this short talk to the writings of several, especially Dr. O. W. Park of Iowa State College. Professor Park has in one writing defined nectar as "the sweet liquid secreted by many plants which is composed very largely of sugar and water." This is not an exhaustive definition. Those having a background of knowledge of chemistry will find it interesting to study the chemical processes whereby in a green plant sugars are formed in solution. Nectar is more than a sugar solution though,—it is a highly complex material produced in nature for the use of plants themselves. Nectar contains considerable water, several sugars, mineral materials, acids, coloring materials, flavoring materials, enzymes, vitamines and perhaps other materials still to be discovered. We must give credit to plant life in and through which the elements of nature in earth and air and the action of our ever valuable sun and sunlight play their part.

Even though much is supplied for the bees ready-made their part is still very wonderful. Only a part of the bees in a hive are field bees. Some serve as nurse bees for the young, some as house bees, some carry water, and some have other duties. Usually the younger bees care for the hive and become field bees when other young bees take their place in the hive. Nature has given worker bees a honeysac into which they take nectar from the flowers. As soon as taken the bees put a substance produced by themselves and known as invertase into the nectar. Four-fifths of the change, making honey ready for assimilation by the blood stream, is found to take place before the bee finishes gathering its load and reaches the hive. The change continues in. the hive until nearly complete. Nectar as found in flowers contains from twenty to seventy or eighty per cent water, depending on the plant itself and the humidity of the atmosphere. It often is much like sweetened water. Within the hive the bees in several ways evaporate out the surplus water. Much of

* Radio talk from Station W.H.B.F., Rock Island, December 8, 1929.

this work is done in the height of the active season. A hive which made a gain of ten pounds in weight during the day may lose three or four pounds during the night. Ripe honey contains about fifteen to twenty per cent water, which is just about enough to allow it to remain in liquid form.

A field bee seldom deposits its load of nectar in the honey comb. It is given quickly to one or more house bees and the field bee returns, as a rule, to the field in three or four minutes. The average speed of a bee in flight is about fifteen miles per hour. Bees usually gather within one or two miles of the hive, but may go several miles farther if necessary to reach a source of nectar. If nectar is abundant a load may be taken in a few minutes, or as much as a half an hours time may be required with unfavorable conditions. Often nectar secretion and other conditions are favorable during only a few hours of the day so that five to ten trips may be all a bee makes in a day. As many as thirty trips may be made under very favorable conditions. Careful study by investigators shows that a bee may carry its own weight in nectar but usually carries about twenty-five to fifty per cent of its weight. This means that from two to four pounds of bees at one trip are required to carry one pound of nectar. On the average two pounds of nectar are required to produce one pound of honey. Twenty to thirty thousand bee trips are required then to produce one pound of honey.

Professor Park to whom I referred before has figured it out that if it were possible for a single bee to gather a pound of honey it would have to work every day in the year for eight years and in so doing would travel seventy-five thousand miles or three times around the earth. This is just another example of the prolificness of nature, if not in our behalf, at least for our benefit. Bees travel seventy-five thousand miles to produce a pound of honey. A good sized family may consume it in one meal.

In honey we have nature's own sweet, with the perfume of the flowers, so changed as to be ready for immediate use by us. It is our best health sweet. Because it imposes no strain in digestion it is valuable with infants and children, invalids and older folks. It is a food for the strong as well. Many years ago Greek runners took honey just before going into their races because of immediate energy derived therefrom. Mr. Demuth, editor of Gleanings in Bee Culture, says that when he puts in an extra long day with his bees he finds it much help to take a few ounces of honey diluted in water during the middle of the afternoon. The use of honey mainly as our sweetening food will make for good health with all of us.

BEES AND HONEY.*

(M. J. DEYELL, Medina, Ohio.)

I am going to say a few words about bees and honey. Without a doubt all of you listeners have seen bees, and have tasted honey.

First, regarding bees, there are different kinds of bees, solitary bees, those that live alone, and social bees or those that live in colonies or communities. There are many species of both kinds but the kind we are most interested in is *Apis mellifica,* which means honey makers.

Many of you have seen a swarm of bees. A few years ago while engaged in commercial honey production in northern Michigan an enormous swarm of bees issued from one of my hives. I prepared to hive the swarm, which clustered on an apple tree. To my surprise the swarm, after being hived again issued and after hovering over the bee yard a few minutes, started to fly toward a large swamp a mile or so away. I grabbed up my bee smokers, bee veil and an old wash tub, jumped into my old Ford truck and started after them. They kept parallel with the road and just ahead of me until they got to the swamp and it was there I lost sight of the biggest swarm I have ever seen. They very likely made their new home in a hollow tree.

It is natural to inquire about the inmates of a hive. There are three kinds of bees in a colony, the queen or female, the worker bees or undeveloped females, and the drones or the male bees.

There is but one queen in a colony. She is the soul of the colony. Her business is to lay eggs in small wax cells, one-fifth of an inch in diameter. The eggs change into larva and later into young bees. A queen is capable of laying over two thousand eggs a day or more than her own weight in eggs. The queen is not the boss of the colony as many suppose. She co-operates with the worker bees and drones in carrying on the work of the hive. A queen may live three or four years, long enough to lay over one million eggs. The poultry men would be interested in hens with such characteristics.

In a normal hive there about ten or fifteen thousand worker bees in the spring and later on during the main honey flow approximately seventy-five thousand bees. The life of a worker bee during the summer months is not over six weeks. Often times they fall down at the entrance of the hive with their load because their wings have become worn. They work themselves to death. Not many human beings are thus afflicted with over work.

Drones are gentlemen of leisure. They hang around the hive all summer and gorge themselves with honey. In the fall the poor loafers

* Radio talk from Station W.H.B.F., Rock Island, December 8, 1929.

are shoved out in the cold to perish. The ethics of the hive are that if individuals do not work neither shall they eat.

Honey is one of the most healthful and delicious sweets. It was the main sweet long before sugar was dreamed of. It is especially healthful for children. It is an energy producing food.

Honey is produced in two forms, comb and extracted honey. For those who persist in trying to eat peas with a knife, honey can be used to very good advantage by dipping the knife in the honey and allowing the peas to adhere to the honey. As I have already said, honey is an energy producing food. It is easily assimilated. Should you ever experience a tired feeling in the morning after celebrating the night before, the following receipe will be found helpful. Into a glass of warm water mix one teaspoonful of honey. It makes a delicious drink. The honey being predigested goes directly into the blood stream and produces energy immediately.

My message to you is, keep some bees in your back yard and experience the joys of beekeeping; and eat honey in order to keep fit.

BROOD REARING TEMPERATURE AND VARIATIONS IN DEVELOPMENTAL PERIODS OF THE HONEY BEE.

(V. G. Milum, Champaign, Illinois.)

An attempt has been made in previous issues of this report and that of the Iowa State Apiarist to review the available information concerning temperature relations of the honey bee colony. To date various phases have been covered including the temperature of the winter cluster, the temperature of individual honey bee, flight temperature, and the proper temperature for cellar wintering. To round out this series of articles to include all phases of temperature relations of the honey bee it seems desirable to add this last article having to do with the temperature of the brood nest and brood rearing and the effect upon the development of the individual bees. As with the other divisions of the subject the writer will add his own observations on the question.

Literature on Brood Rearing Temperatures.

The first reliable indication as to the temperature of the brood nest of the bee colony was probably given by Reaumur in 1734, who was quoted by Huber in 1814 and Kirby and Spence (A.B.J. 2:191-2) as finding a temperature of 93° F. in the brood nest of a hive in January, which was also observed by Huber. According to Kirby and Spence, Bonnet in 1790 also reported finding brood of all ages in a hive in January. According to Schafer (Textbook of Physiology, 1898, pp. 792-793), Hunter in 1837 declared that no stage of brood could exist at a temperature as low as 17° C. (62.6° F.). Huber observed the temperature of the hive in summer to be 95° to 97° F., with a limit of 99.5° F. in the most populous hive at an outside temperature of 94° F. He criticised Dubost, who, according to Huber, asserted that worms could not hatch below 32° C. (104° F.), saying that this high temperature was probably the result of thrusting the thermometer suddenly into the cluster with the resultant agitation.

Taylor in 1839, wrote that he thought the most favorable degree of prosperity of brood and working of the bees was 75 to 90° F. in the "pavilion" (brood-chamber) and 65 to 75° in the "wide boxes" (storage-boxes or supers), suggesting that a hive be ventilated when the temperature reached 90° F. because he found that swarms always issued at a temperature varying from 90 to 95° F. of internal heat.

Nutt, in 1839, reported a temperature of 110° F. in a colony previous to its swarming out, and 120° F. on the day of the swarm, while on the evening of that day he says the temperature of the "pavilion" had dropped to 90°F. He also gave a long series of one or more daily

readings of the temperature in the colony for a period from April 1st, to July 16, 1826. These varied from 32° to 96° F., which would indicate that the thermometer may not always have been within the cluster or the brood rearing space but probably in a "collateral box." Nutt included in his book a letter from a Mr. Thomas Clark with a group of readings made by the latter from July 1 to 13, 1832, which showed temperatures in a colony ranged from 83 to 90° with outside temperatures of 64 to 68°, which also indicated that the thermometer may have been placed in the supers or "boxes."

Miner in "The American Beekeepers Manual" published in 1849, indicated a "natural" temperature of 60°-70° F., when he said that the egg stage was prolonged at a lower temperature than this. Temperatures of 20 to 29° R. (77-97° F.) in broodnests were reported by Berlepsch in his book published in 1869. Berlepsch found that when brood combs were removed from the brood nest worker bees would emerge, while the drone brood would die, and that the queen also required a warmer temperature than workers. Writing the same year, Meador (A.B.J. 4:168) suggested that bees lose much in the way of accumulating stores because the bees actually stay at home in order to keep up the required temperature of 80° F. in the hive during brood rearing, but would gladly join the harvesting force. A few months later, Gallup (A.B.J. 5:31-32) gave evidence to show that bees actually stay at home to keep up the temperature of the brood nest as claimed by Meador, especially at ordinary spring temperature.

Jeffry (A.B.J. 15:443-4) in 1879, reporting on experiments with eggs and larvae where apparently they were removed from the hives, said that capped worker brood emerged at 58° F., but the workers were weak and soon died, while queens emerging at temperatures lower than 65 to 75° F., never mated and often died within thirty-six hours after gnawing out. In 1881, Root (Gl. 9:399) stated that capped brood without bees will hatch providing the temperature is kept between 80 to 100° F., as he said had been done for years in his lamp nursery. Newman A.B.J. 17:212) in 1881, thought that the best results are attained in brood rearing when the heat of the brood nest is above 70° F.

Dzierzon in 1882, indicated that royal cells are started when the bees are beginning to get uncomfortable at 30° R. (99.5° F.). In speaking of the winter cluster, Dzierzon as previously stated, said that brood could not thrive at a temperature of 59 to 65.75° F., but he did not give this as the maximum lower limit of development.

Dayton (A.B.J. 22:230-1) in 1886, reported finding a temperature of 88° F., at the center of clusters of colonies having brood in early spring and 71° F., at the sides of the cluster.

Doolittle (A.B.J. 25:165-6) in 1887 and later writings in 1889, 1899, and 1906 (A.B.J. 25:325-6; Gl. 27:614-5; A.B.J. 45:363-4), claimed that 98° F., was the warmest temperature that he ever found in a hive in the hottest summer weather, 92° F., was the lowest point that he ever recorded in the center of a cluster having four frames and upwards of brood, while 90° F., was registered in a colony with only three frames of brood after a cool night. In these experiments, Doolittle

used the self-registering maximum and minimum thermometers. Apparently all readings were made during summer months and at the center of the brood nests. A single experiment after September first, indicated a temperature of 81° F., maintained in the brood nest. In the latter article (A.B.J. 45:363-4), Doolittle said that some of the strongest colonies had a minimum of 95° F. He concluded that 92 to 98° F., was the most consistent temperature for rapid brood rearing.

The American Bee Journal for February 15, 1890 (26:101) gave the opinion of various prominent beekeepers upon the following questions: (1) Does it require as much heat for larvae and sealed brood as for eggs? and (2) "Do larvae and sealed brood add any heat to the colony?" While the replies were not based upon scientific evidence, the beekeepers expressed the opinion that sealed brood gave off more heat than larvae, while some thought that eggs require more heat than larvae and others that larvae require more heat than eggs.

About 1897, Albrecht (A.B.J. 37:795) indicated that brood rearing required a temperature of 86 to 95° F. In reviewing some of the literature or knowledge of temperatures of bees (Albrecht apparently included), Miller (Gl. 26:254-5) said that with cold outside temperatures, the bees in attempting to maintain the temperature of the outer edge of the cluster up to 50 to 53° F., sometimes raise the temperature of the center of the cluster "to 86° F., or more" making it warm enough for the queen to commence egg laying which proper temperature for brood-rearing must be kept up. It appears from this that he thought that a temperature of 86° F., might be the maximum at the beginning of brood rearing.

In 1903, Scholl (A.B.J. 43:656) concluded from experiments conducted with a self-registering thermometer, that the normal temperature of the brood chamber is between 94 and 94.5° F. He also suggested that it is easier for the bees to raise the hive temperature to the normal of 94° by heat production than it is for them to lower the temperature to 94 or 94.5° F., by ventilation. His experiments as reported hardly seem extensive enough to justify such a conclusive statement when we stop to consider the variations in strength of colony, season of the year and prevailing temperatures, size and type of hive and especially the amount of ventilation provided.

In 1906, Getaz (A.B.J. 46:834-5), mentioning the experiments of Newport in 1837 and Dubost referred to by Huber, said that the temperature necessary for the brood is about 89 to 90° F., but that it may vary from 82 to 95° F., outside of which the brood seems to suffer.

Miller (Gl. 50:73-4) writing in 1912, indicated that others. whose names were not given, had found steady temperature of about 88° F., in the presence of brood.

In the experimental work of Gates reported in 1914 in U.S.D.A. Bul. 96, the author stated that with the beginning of incubation the temperature of the center of the cluster rose to 93.2 to 95° F. (34-35° C.) and continued fairly constant at that level, although at another point he indicated that the range of the temperature during the summer, after once well established, was 91.4 to 95° F. (33 to 35° C.). Gates found

that the beginning of egg laying in the spring appeared to be closely associated with a temperature of 45° F. (7.22° C.) with an occasional maximum outer temperature of 8 to 11° C. (46.4-51.8° F.), but suggested that other factors, probably food are of importance. He supposed that the gathering of food a week previous to egg laying was an important factor. He found that after brood rearing was once well established, few external factors influenced the hive temperature and these only slightly. Gates reported during a "play flight," there was a slight drop in the cluster temperature, followed by a rise to the former temperature in 15 to 30 minutes, attributing the result to the breaking of the cluster and the liberation of the confined heat and possibly to the excessive fanning at the entrance. The same effect was noted in the spring when the bees first commenced to take field trips, as also in the early morning when the bees left for the field.

From his observations during storms, Gates concluded that the bees are able to control and conserve the temperature with considerable constancy, even with high winds and relatively low temperatures. During the summer, and especially during storms, the crowding of the bees below the frames often raised the temperature at this point to or above that of the cluster. When the experimental colony was moved by wagon to a new location, the maximum temperature recorded increased from 93.2° F. (34° C.) to 96.8° F. (36.0° C.), while for a few hours following and when the bees had their liberty two of the thermometers registered 97.2° F. (36.2° C.). Since no brood died during the moving of the colony, Gates concluded that 96.8° F. (36° C.) is not an abnormal temperature for bees.

Brunnich (A.B.J. 46:298-9) in 1916, stated that brood requires a uniform warmth of 98° F. and is such under all circumstances, or else the growing insect may be injured. The same year, Latham (Gl. 44:973-4) wrote that brood rearing progresses only as the force of bees can warm up more comb and keep it warm. He said that if queens lay in combs that are not of the desired temperature, the brood will not mature. Too high a temperature is not conducive to brood rearing. Latham observed that a comb on the side of the hive toward the sun may be filled with brood in early spring and not in July.

Phillips in his "Beekeeping," 1919, asserted that the uniformity of the temperature of the brood nest is greatly overestimated, that it may vary over several degrees, but rarely exceeds 97° F., and when the outside temperature exceeds the maximum hive temperature, the temperature of the cluster is reduced by fanning. The same year, Kidd (Bee World 1:137-9) reported placing frames of mostly sealed brood in an incubator at 90° F., with occasional temperature of 100° F., yet with no serious results.

Brunnich (Archiv f. Bienenkunde, 4:116-7) in 1922, found that with queen cells reared under special temperature control, the nearer they reach their full development the more dangerous were temperature variations from 38½-39° C. (101.3°-102.2° F.) that he maintained about the queen cells in the brood oven. If the temperature dropped as much as 2° C. (3.6° F.) for as long a period as one to two hours, the

queen emerged with unfolded wings; if the temperature rose as much as 2-3° C. (3.6-5.4° F.), then the queens usually died. He thought that the bees must have a very great ability to regulate the temperature in the hives, which the bees maintain at least as he says at 38° C. (100.4° F.) in the brood nest.

Armbruster (Der Warmehaushalt in Bienenvolk) in 1923, indicated that in a colony of bees in summer with brood rearing in progress, the colony reactions were regulated by two temperature limits, a lower one of 34° C. (93.2° F.) and an upper one not higher than 34.8° or 35° C. (94.6-95° F.). He concluded that the optimum temperature for brood-rearing was at 34.2° C. (93.6° F.).

In the 1923 edition of "A.B.C. and X.Y.Z. of Beekeeping," Root and Root say that the temperature of the hive should be kept down to about 96° F. in summer. Cale (A.B.J. 63:543-5) in 1923 indicated that a temperature of 97° F. is necessary for egg laying to start and to continue. When questioned upon this point, he admitted in a letter to the writer, that 97° F. was a little high, 93° F. probably being more nearly correct.

Merrill (Bee World, 6:102-3) observed that the beginning of brood rearing is also a temperature response. He called attention to the well-known fact that bees form a cluster when exposed to 57° F. temperature and then expend their own energy to maintain a suitable hive temperature. But whenever the temperature rises above 57° F. in winter and remains that high long enough for the bees to loosen their cluster and is then followed by a sudden drop of 20 degrees, he said, the bees will be caught unawares and in their attempt to secure a suitable hive temperature, they will raise the temperature higher than is needed and thus increase it to the desired temperature for brood rearing and the queen starts egg laying. Merrill says that any unusual disturbance causes bees to increase their temperature with resultant egg laying, which explains why weak colonies bring on their destruction when they start brood rearing as a result of attempting to keep warm. Merrill did not state whether the reactions here detailed would happen in the early part of winter or only in the latter part of winter, as he did not qualify his statement in any way.

The writer has given in previous papers (A.B.J. 65:368-370; 24th An. Rpt. Ill. St. Bkprs.' Assn. pp. 99-106) a part of the information relative to the subject to be included in this paper but since further points are to be added a review of these papers will be omitted at this time.

Literature on Development of Honey Bee.

Now that we have reviewed the writings relating to the temperatures maintained in colonies during brood rearing, let us retrace our steps to find what relation, if any, the previous writers have given to the relation of the temperature of the brood nest and the length of the developmental stages of the honey bee.

From a historical point of view, a study of the literature upon the relation of temperature to the developmental periods of the honey bee

shows that the accepted figures for the periods of development of the different sexes have been those determined by observations usually upon colonies of bees during the warmer months of summer, with some observations of the effect of temperatures upon these periods, under the more extreme temperature limits.

There is an abundance of literature upon the relation of temperature to the development of other insects and classes of animals. This literature is so voluminous that no attempt has been made to review it, our efforts in this line being confined to the honey bee *(Apis mellifica)*.

Aristotle whose writings, published previous to 322 B.C., are apparently the oldest on the subject of the honey bee that have been preserved for modern investigators, expressed no ideas relating to temperature nor did he give any periods of time for the developmental stages of the honey bee. Pliny writing during the first century gave 45 days for the period of development probably referring to the worker honey bee, as Butler suggested in 1623. Butler, himself, apparently speaking of the worker, said that the complete period was all within a month, but that during continuous fair weather he had known this to happen within three weeks. Thus we see that Butler was expressing a relation of temperature to the length of the developmental period. He gave no periods for the queen or drone, but did express the idea that they helped the females in hatching because of their great heat.

Kelly in report of the Maryland State Beekeepers' Association for the year 1922 quotes from Richard Remnant's book published in 1637 in part as follows, "within 18 to 21 days, as the weather is colder or hotter they come forth."

Thorley in 1744 said the egg stage lasts for a few days, that there is no further care of the worms after the eighth day when the cells are stopped up, and that in the space of eighteen or twenty days "it is a perfect bee." Thorley considered the first week after emerging as an infantile stage. He made no reference to temperature relation of bees.

The 1758 translation of "The Book of Nature" gives the opinion of Swammerdam on the subject of development. He calculated from the fact that young queens may possibly swarm again in a month to six weeks, that twenty-four days in summer was about the time from the beginning of feeding of a larvae to a perfect bee. Swammerdam indicated the possibility of an increased developmental period when he compared the honey bee with worms and caterpillars which might be prolonged ten days beyond the usual time, or even for months if the preceding change happened in late fall or autumn.

Wildman in 1768, gave four days for the egg stage, with the cell being closed with wax after the eighth day from birth, remaining closed for twelve days before emerging, or twenty days in all. Keys writing twelve years later, expressed the idea that cold weather greatly retards the hatching of the brood, but he may have meant the amount of brood for in another part of this book, he gave three days as the length of the egg stage, five or six as a maggot and twelve days more before the young bee breaks through its capping.

Huber in 1814 gave the following periods without expressing any relation to temperature, but rather suggesting that they are exact

periods: for the worker, three, five and twelve days for the egg, larva and pupa or twenty days for complete development; for the queen, three, five and eight days, or a total of sixteen days; and for the drone, three, six and one-half, and fourteen and one-half, or a total of twenty-four days for complete development.

Bevan in 1827, gave periods of three days for the egg stage of the queen, five days as a larva, four and one-third as a nymph (apparently including the period after "the repose"), and sixteen days for complete development. In addition, he said, that spinning the cocoon occupied twenty-four hours and the tenth, eleventh, and two-thirds of the twelfth day is spent in repose. In speaking of the worker's development, Bevan gave four days for the egg; four, five or six for the larva, depending upon the season; and twenty-one days for complete development. He quotes Schirach as saying that this time is two days later in cold weather than in warm weather. For the drone, the periods given are three days in the egg, six and one-half as a larva, emerging as an adult on the twenty-fourth or twenty-fifth day after the egg is laid. Bevan said that the development of each species (caste) proceeds more slowly when the colonies are weak or the air is cool, while in very cold weather it is entirely suspended.

In 1839, Taylor indicated that the time of development as being sixteen days for the queen, twenty-one for the worker and twenty-five or twenty-six for the drone. He said that the worker eggs are hatched in four or five days, followed by a larva or grub stage of four to six days, but he did not correlate these variations with temperature, for he gave a definite period of twenty-one days for complete development of the worker. Writing the same year, Nutt gave fourteen or fifteen days as the time for the development of the queen.

Huish in 1844 asserted that the eggs hatched on the fourth day, the larvae spent six days feeding according to the weather, and the bee spent fifteen days as a nymph, which would mean a total of twenty-four days for complete development.

The first volume of the American Bee Journal published in 1861 gives an account of the development of the worker bee probably translated from one of Gundelach's books published in 1842 and 1852. This account, in addition to giving a detailed description of the developmental changes of the worker, stated that the eggs hatch in forty to sixty hours according to the heat of the hive, the larvae are fed for six days after which they are capped over, with the adult worker emerging in twenty-one days ordinarily, but in twenty days during favorable weather. According to Berlepsch in 1869, Gundelach gave periods for the queen of eight days as an unsealed larvae and seven days as a covered nymph, for the worker six and thirteen days for the larvae and nymph, and for the drone six and fifteen days, respectively.

Miner in 1849, gave sixteen, twenty, and twenty-four days respectively, for the development of the queen, worker and drone. In a natural heat of 60 to 70° F., the egg stage lasts three days, but may be prolonged in colder circumstances, even to complete suspension of vitality for a period. He also indicated a temperature relation when he says

that larvae may be fed from four to six days before sealing over, according to the heat of the hive, but he did not indicate that this decreases the total developmental period in any way.

Samuelson in 1860, gave sixteen days for the period of development of the queen, for the worker about twenty, and twenty-four days for the drone, but expressed nothing in regard to temperature relations.

Baldridge (A.B.J. 1:109-110) in 1861, asserted that usually twenty-one days was required to complete the development of workers in his latitude (43° N.), and twenty-four days for perfect drones from the time the eggs are laid. He stated that the time required from the laying of the egg to the sealing of the cells is very dependent upon the temperature. He indicated possibilities of the hatching of eggs varying from two and one-half to three days. Langstroth (A.B.J. 1:143) reported a queen cell in a nucleus that required twenty-one days to reach maturity.

Quinby in 1864, criticised certain discrepancies regarding statements of Huber as to the periods of development as quoted by Harpers, which are not shown in Dadant's translation of Huber's book. Quinby allowed three days for the hatching of the worker egg, the larvae being sealed over six days later, and twelve days in the closed cell, emerging at the end of this time, which would be twenty-one days. Yet in his next statement, Quinby declared that the period from egg to the perfect bee varied from twenty to twenty-four days; averaging about twenty-two for the worker, and twenty-four for the drone. Quinby stated further that the temperature of the hive varied somewhat with the outside atmosphere and with the number of bees; a low temperature retarding development and a high one facilitating it.

Neighbour in 1866, wrote that in four or five days the egg changes to a worm, remaining in the larval stage from four to six days, maturing in twenty-one days unless retarded by cold weather. Queens and drones require a higher temperature, according to Neighbour, hatching in summer weather in sixteen and twenty-four days, respectively. In the same year, Wagner in a short extract in the American Bee Journal, page 76, said, "Heat has great influence in promoting the hatching of the brood in the spring." A few years later, Wagner (A.B.J. 2:158) gave three days as the period of the egg stage of the queen, five days for the larvae, one day for spinning the cocoon, two days and sixteen hours of quiescence, and four days and eight hours as a pupa, making a total of sixteen days for complete development. These periods were based on assumption of ordinary summer weather; cold weather protracts the period while warmer weather may hasten, he said. Twenty and twenty-four days were given for the period of development of the worker and drone.

In 1861, Berlepsch (A.B.J. 1:199-202) gave evidence to show that the usual period of development of the queen is seventeen or eighteen days. In reply to Berlepsch, Dzierzon (A.B.J. 1:225-6) among other things stated that under conditions of favorable and equal temperature and with brood-rearing regularly continued, seventeen days appeared to be sufficient for complete development of the queen, but deficiency of heat may prolong this period. In another article two months later, Dzierzon (A.B.J. 1:265-6) gave evidence to show that under specially favorable circum-

stances queens may develop in less than fifteen days. Dzierzon in his "Rational Beekeeping," published in 1882, asserted that under favorable circumstances workers emerge in nineteen days, but generally at the end of twenty to twenty-one days.

The first volume of the American Bee Journal, 1861, gives a review of further observations of Berlepsch apparently from an early edition of "Die Biene," the 1869 edition of which, gave the periods for complete development as sixteen to seventeen days for the queen, for the worker nineteen to twenty-one days, and twenty-four to twenty-six days for the drone. He quoted Dzierzon, Huber, and Gundelach on development, previously mentioned in part. His observations gave five and one-half days as an uncapped larvae for the queen and eight and one-half days as a capped nymph; six and eleven days respectively, for the worker; likewise, six and fifteen days for the drone. However, Berlepsch claimed that with a native race of bees, he had observed a queen, worker, and drone emerge before the sixteenth, nineteenth, and twenty-fourth days, respectively. When he placed a comb at the outside of the hive where there were few bees, workers emerged as late as the twenty-fourth to twenty-sixth day, and queens from twenty to twenty-two days when they did not die, and drones as late as the twenty-eighth day. Berlepsch found that when brood combs were removed from the brood nest worker bees would emerge while drone brood would die, and that queens also required a warmer temperature than workers. Later observations led Berlepsch to say that an Italian queen might develop in less than fifteen days, and Italian workers within eighteen and one-half days.

Pettigrew in "The Handy Book of Bees" published in 1870 allowed fourteen, twenty-one and twenty-four days for the complete development of queens, workers, and drones, respectively, but expressed no temperature relations. Hunter in "A Manual of Beekeeping" published in 1875, considered sixteen, twenty-one, and twenty-five days as the time required for the development of the different sexes.

Newman (A.B.J. 17:285) writing in 1881, gave three, five and eight days for the egg larvae and pupa stages of the queen bee or a total of sixteen days; three and one-half, about five and twelve and one-half, respectively, or a total of twenty-one days for the worker; and three, six and one-half, and fourteen and one-half or fifteen and one-half, a total of twenty-four or twenty-five for the drone's development. He said that when the weather is cool or the colony weak, development is retarded to a greater or less extent. According to Newman, the heat or temperature of the brood nest should be above 70° F. for the best results. Newman in "Bees and Honey" published in 1911, gave the usually expressed periods of development of the queen, worker, and drone of sixteen, twenty-one, and twenty-four days, respectively, with no suggestion as to temperature relations.

Alley in 1885, stated that the eggs will hatch in three and one-half days, the larvae are sealed four and one-half days later, and the queen emerges in eight days more, or sixteen in all. He gave the time required for the worker as being nearly twenty-one days; and for the drone, twenty-four days to complete development. No temperature relations were expressed by the author.

Cheshire in the 1886 edition of his book, in commenting upon Huber's findings of sixteen, twenty-one, and twenty-five days as the time required for the three sexes of bees to reach maturity, said that these are only approximations, only twenty days being necessary in one hive while another may require twenty-one days for the workers to gnaw out. Huber in his 1814 edition as translated by C. P. Dadant, actually gave twenty days for the worker. Cheshire says that eggs of the same hive and of the same hatch especially drones require unequal times of evolution, while the season of the year alters the length of time. He further claimed that by special management the queens may be delayed to nearly eighteen days, the workers to twenty-four days and the drones to twenty-eight days, and even greater if the combs of brood are removed from the hive.

Briner (Gl. 14:16) reported in 1886, that he had observed bees emerging from combs nineteen days after the empty frames without foundation were inserted into the hives, some of them already having been replaced by eggs. He thought some had emerged a day or two before. Root in his comment on the letter, said that exceedingly favorable circumstances may shorten the period as much as twenty-four hours, but he thought that Briner had made a mistake.

Robbins (Gl. 14:42-3) in 1887, reported results of his experiments which seemed to indicate that lack of milky fluid prevented eggs from hatching, but if supplied within forty-eight hours of the regular time of hatching, this natural event would take place. He thought that this idea might explain or account for the discrepancies in the development of the queen, being from sixteen to eighteen days. However, Lineburg has shown that eggs will hatch without the presence of royal jelly or food pap.

Hicks (A. B. J. 18:584) in 1882, expressed the time for the developmental periods as follows: Sixteen days for the queen; about twenty-one days for the worker, and twenty-four days for the drone.

Hughes (Gl. 11:21) in 1883 reported the results of his experiments on the length of time required for queens to emerge, his conclusion being that it was usually fifteen days and some hours. He pointed out that when one Pond thought he had queens hatched in ten or eleven days from the egg, Pond was probably misled by a virgin queen from another colony having entered the hive and destroyed the queen cells, Hughes showing that virgin queens might fly soon after emerging from the cells. Extreme early development was also reported by Veach (Gl. 11:756) when he said he had young bees emerging from combs in a hive that swarmed two weeks after it was hived on brood free combs. As the editor commented, there must have been an error somewhere in the observations of Veach.

Doolittle (Gl. 15:165-6) writing in 1887, asserted that extreme heat will hasten the development of the worker bee to a period of only nineteen days, while cool weather may retard development to as much as twenty-four days. Queen cells in a queen nursery after September 1st were often delayed from the usual sixteen days to twenty-four days and

sometimes more, while later they did not hatch at all. In 1904, Doolittle (Gl. 32:838) reported that twenty-one days was near enough to the time for the development of the worker bee for all practical purposes, but he had noticed bees to emerge in nineteen and three-fourths days and some that required nearly twenty-four days, warm weather accelerating and cold weather retarding development. He suggested that there might be as much variation as half a day either way from the usual sixteen days for development of the queen.

In 1888, Abbott (A. B. J. 24:223-8) gave the usual periods for development as sixteen, twenty-one and twenty-four days, expressing no temperature relations. In the same year, Gould (Gl. 16:685) reported delayed hatching of eggs in a weak nucleus to between the sixth and seventh day. Robinson at one place in "British Bee Farming," 1889, gave sixteen days for the complete development of the queen, twenty-one days for the worker, and twenty-four days for the drone, while at another point in his book, he gave sixteen, twenty-one and twenty-four days as the required periods. He also stated that worker larvae may be capped after four, five or six days, the queen in five, and the drone in six and one-half days, but no statement is found in regard to temperature relations of development.

Brice (A. B. J. 39:579-580) in 1899, expressed the time required for complete development as sixteen, twenty-one, and twenty-four days under normal conditions, but said this might be extended to nineteen days for the queen, beyond twenty-one days for the worker, and more than twenty-four days for the drones, depending on the time of the delayed capping of the brood by the bees, but he did not indicate the cause of the delay, except that he said it often happened with worker larvae in the case of queenless colonies. Brice indicated that in the case of the queen, the egg hatches on the fourth day, the larva is fed until the eight day and is capped on the ninth day; while worker larvae are fed until the end of the eighth day, sometimes to the twelfth day, and the drone larvae until the ninth day when they are capped.

Webster in his "Book of Beekeeping" said that the queen's development required sixteen days, while the worker is three days in the egg stage, seven as an uncapped larva and twenty-one days for complete development, but only twenty days in warm weather.

Dr. C. C. Miller (A. B. J. 40:451-2) in 1900, quoted Cowan as saying that queens mature in fourteen to seventeen days, the average apparently about fifteen days. Miller pointed out that the difference between the observations of Cowan and those of Berlepsch and others was probably due to the fact that nuclei were used for observational purposes in some cases while strong colonies were used in others. Miller's observations showed that queens could be developed in less than fifteen days, and that there was apparently greater variation in the time of sealing the queen larvae cells than those of the workers.

In 1911, A. C. Miller (Bee World, 6:102-3) said that a queen cell may be sealed when the larvae is only four days old from the egg and yet a fine queen will result.

Morley in 1915, gave the days for complete metamorphosis from the egg to maturity as fifteen and one-half for the queen, twenty-one for the worker and twenty-four for the drone, with no expression of temperature relations.

Root (Gl. 44:427) quoted Mell Pritchard as saying that it takes from fifteen to seventeen days for queens to fully develop from the egg and emerge as adults. He divides the fifteen day period up into three days for the egg, six days for feeding of the larvae and six days sealed in the cell. If the weather is unfavorable, so that seventeen days are required, the periods are lengthened. Miller (Gl. 44:521) in an editorial comment on the above, declared that he did not believe any queen larvae were ever capped later than the fifth day, and that no good queen ever took seventeen days for complete development, although under extremely poor circumstances, eighteen or more days might be required. Further comment by Doolittle (Gl. 44:590) on this same subject, included statements that he had observed queens emerge in fifteen days and a few hours but never in fifteen days or less, while on the approach of winter he reported having seen queens that required eighteen and nineteen days to complete development. Then Pritchard (Gl. 44:805-6) to continue the controversy, reported some careful observations in which some eggs that hatched in less than three days were transferred to artificial queen cells, which were all sealed by the bees in less than eight days one and one-half hours, one of these queens emerging in less than fourteen days twenty-one and one-half hours, while another emerged in less than fifteen days and two hours. These queens were probably reared in strong cell-finishing colonies in the hot month of August, and as Root in the editorial comment suggested, what would have been the result in weak colonies in cool weather. Miller (Gl. 44:905) closed this popular discussion on this subject for the time being by a general review of the information on the development of the queen which seemed to show that about fifteen days was the usual time for development of queens in warm weather and expressed a doubt as to the advisability of having conditions such that a greater length of time for the development is needed.

In the 1919 edition of "Beekeeping," Phillips states that due to the fact that the bee colony creates its own temperature, the developmental stages are practically uniform in length of time, being slightly modified by changes in the temperature of the hive. Phillips gave a table of the development stages which he considers a fair average. This table gives a three day period for the eggs of all three sexes, five and one-half, six, and six and one-half days, respectively, for the unsealed larvae of the queen, worker and drone, and seven and one-half, twelve and fourteen and one-half for the pupal stages of the same, making a total of sixteen, twenty-one, and twenty-four days for the complete development of the queen, worker and drone, respectively.

In Dadant's "First Lessons in Beekeeping," fifteen, twenty-one, and twenty-four days are given as the average duration of time for complete development of queen, worker and drone, respectively, in summer weather, with lengthened time in cool or cold temperatures. In the

"Dadant System of Beekeeping," published in 1920, Dadant states that worker bees develop in twenty-one days under ordinary circumstances. The twenty-second edition of Langstroth on "The Hive and the Honey-bee," revised by Dadant in 1923, gives the usual periods of sixteen, twenty-one, and twenty-four days as the average time for complete development of the three castes of bees, the figures being based upon summer warmth, stating that in cool or cold weather the time will be somewhat lengthened.

Lyon writing in 1920 says that on the fourth day the egg has developed into a tiny white grub and that the six day old larva (ten days from the time the egg was deposited by the queen) is capped by the workers, the young bee gnawing through the capping in twenty-one days. He gives fifteen to sixteen days for complete development of the queen and twenty-four for the drone.

Root and Root in their 1923 edition, say that the young worker bee will emerge in about twenty-one days from the time the egg is laid, or it may be twenty days if the weather is favorable. A report is given of seeing a larvae completely capped over in six days and seven hours after the hatching of the egg, but the statement is made that this time may be reduced to less than six days if the weather is warm. Twenty-three or twenty-four days is given as the period for the development of drones and fifteen days for the queen.

Prell (Bee World, 5:96-7) in 1923, reported the usual twenty-one days for the development of the worker, with three days in the egg stage and sealing of the cell on the eighth day. Atkins and Hawkins in "How to Succeed with Bees," published in 1924, gave the same table for development as that given by Phillips.

The observations of Nelson and Sturtevant (U. S. D. A. Bull. 1222) showed that larvae three days old that had hatched from eggs all laid within a three-hour period showed a great variation in weight, indicating unequal development. Likewise sealing of the cell may be begun as early as the end of the fourth day after hatching and it may be delayed to the end of the fifth day according to their observations. The writers state that in another set of observations the larvae were sealed between five and five and one-half days.

Nolan in 1925, concluded in part as follows: "The number of bees in the colony at the beginning of brood-rearing in the spring, the ability of the queen, the abundance of stores, the suitability of the combs and proper insulation are the most important factors within the control of the beekeeper which determine the amount of brood reared by a colony. Prolonged inclement weather retards broodrearing in the spring, although a strong colony may be able to maintain its rate through unfavorable cold weather of only a few days duration, even though it is not packed."*

Milum, in an M. S. Thesis written in 1923, and in articles appearing in the American Bee Journal for 1925 (65:368-370) and in the 24th Report of the Illinois State Beekeepers' Association, indicated

* Nolan, W. J., 1925. "The Brood-Rearing Cycle of the Honey-Bee." U. S. D. A. Bul. 1349 pp. 36-37.

temperatures of brood nests varying from 76.3 to 97.5° F. and variations in periods for complete development for worker bees. Since the writer is to give the results of these observations in greater detail in this paper, a complete digest of these original papers will not be included at this point.

Spring Brood Rearing Stimulation.

Having reviewed the literature upon the subject of this paper, the writer would like to add certain other observations and conclusions in more detail than given in the publications mentioned in the previous paragraph. The source of this material is observations and records taken at the Wisconsin Experiment Station during the period of 1921 to 1925 under the direction and cooperation of Prof. H. F. Wilson of the Department of Entomology. These observations were published in part in Wisconsin Experiment Station, Research Bulletin No. 75. All temperatures given hereafter in this paper will be those of colonies in hives each equipped with 44 copper-constantine thermocouples of which the temperatures could be determined by a potentiometer without disturbing the colony, as described in this bulletin. The observations to be given on the subject in this paper were not included as such in the bulletin mentioned since it was concerned chiefly with winter temperatures of the brood nest.

Allow me to first direct your attention to some data relative to the stimulation of broodrearing after the winter quiescent period. With a colony wintered with 6½ inches of packing for the winter of 1921-1922, a flight period on March 13, with the highest temperature of the hive mounting to 90.2 and remaining above 90° F. for the succeeding days, seemed to be the stimulation for beginning of broodrearing. When the colony was opened on April 5th, 23 days later sealed brood and eggs only were found. Evidently broodrearing had not been continuous, either due to lack of pollen or inability to gather water.

A colony in a double-walled hive obtaining a flight on February 9th did not raise its temperature high enough to stimulate broodrearing as evidenced by a highest temperature of 72.5 ° F. two days later. This flight on February 9th likewise seemed to retard the colony from taking a flight on March 13th when the previous colony mentioned took a flight. The stimulus of accumulated feces for the colony without flight on the previous date was probably the stimulating factor for it to take flight on March 13. This colony in the double-walled hive, even though it did not fly on March 13, was apparently stimulated to temporary broodrearing since its highest temperature mounted to 88.8 ° F. the following day and sealed brood and eggs only were found on April 5, 22 days later.

Table 1 gives the brood nest temperatures of five experimental colonies at various dates during the spring of 1923. Following each date is the recorded outside temperature at the time of the reading of the hive temperatures. The number of square inches of brood and the limits of the brood nest temperatures on the various dates are listed.

TABLE 1—SPRING TEMPERATURES OF THE BROOD NEST, 1923.

Colony No. 1 Double-walled 1922 Queen	Colony No. 2 No Packing 1922 Queen	Colony No. 3 No Packing 1920 Queen	Colony No. 4 10½" Packing 1922 Queen	Colony No. 5 7" Packing 1921 Queen
Apr. 11, 42.2°F. 230 sq. in. Brood =88.6°-90.2°F.	Apr. 11, 44.8°F. 275 sq. in. =76.3°-88.4°F.	Apr. 11, 40.5°F. 48 sq. in. =88.1°-91.5°F.	Apr. 11, 45.8°F. 80 sq. in. =90.2°F. Edges=86.7°-87.0°	Apr. 11, 46.5°F. 114 sq. in. =90.2°F. Edges=78.8°-86.7°
Apr. 18, 57°F. =91.1°-94.6°F.	Apr. 18, 57°F. =90.4°-93.6°F.	Apr. 18, 56°F. =92.3°-94.0°F.	Apr. 18, 56°F. =91.9°-93.9°F.	Apr. 18, 56°F. =91.1°-92.3°F.
Apr. 26, 70°F. 545 sq. in. =90.3°-93.8°F.	341 sq. in. =87.9°-93.1°F.	349 sq. in. =91.6°-93.7°F.	363 sq. in. =90.1°-93.2°F.	286 sq. in. =89.9°-92.4°F.
May 4, 51°F. 697 sq. in. =89.9°-94.5°F. Edge=87.5°F.	May 4, 51.3°F. 543 sq. in. =90.1°-94.1°F. Edge=88.1°F.	May 4, 49.3°F. 429 sq. in. =92.3°-94.9°F. Edge=88.8°F.		
May 8, 38°F. =85.6°-92.3°F.	May 8, 37°F. =83.0°-92.7°F.	May 8, 36.3°F. =88.9°-93.1°F.	May 8, 34.2°F. =92.8°-95.0°F. Edge=89.8°F. May 10, 647 sq. in.	May 8, 34.5°F. =89.7°-92.3°F. Edge=86.1°F. May 10, 510 sq. in.
May 24, 65.2°F. 1,079+481 sq. in. =90.2°=94.4°F.		May 10, 75.6°F. 1,013 sq. in. =92.4°-94.7°F. Edge=90.7°F.	May 18, 73.8°F. 1,155 sq. in. =94.1°-95.3°F. Edge=93.6°F.	May 17, 60.3°F. 973 sq. in. =91.1°-94.5°F.
May 31, 77.2°F. Hive Body =90.8°-95.3°F.	May 31, 77.6°F. 1,285+82 sq. in. =91.9°-95.0°F. Edge=91.6°F.	May 31, 77.9°F. 1,173 sq. in. =92.4°-94.7°F. Edge=91.4°F.	May 31, 78.6°F. Hive Body =91.5°-94.4°F.	May 29, 78.8°F. Hive Body =91.5°-94.4°F.
June 1, 85.7°F. Hive Body =94.5°-96.6°F.	June 26, 71.9°F. 839+286 sq. in. B=92.8°-95.3°F.		June 1, 90.2°F. Hive Body =94.9°-96.3°F.	June 1, 89.8°F. Hive Body =95.3°-97.5°F.
	July 11, 77.9°F. 870 sq. in. B=91.7°-95.0°F.	(Removed from Bee Cellar April 10)	June 4, 72.8°F. B=92.3°-93.8°F. June 18, Swarm	June 26, 71.3°F. B=91.3°-95.4°F. 993 sq. in.

NOTE:—All temperatures given in Table 1 are those of thermocouples surrounded by brood, except those after "Edge," which are temperatures of thermocouples with brood on only one side of comb and those following the words "Hive Body" or "B," which are temperatures of the entire set of thermocouples in the brood chamber.

Apparently all of the four outdoor wintered colonies and probably No. 3 in the bee cellar started broodrearing on March 2 when the four former obtained a good flight, their highest temperature within the cluster being as follows: No. 1—92.8 ° F.; No. 2—94.5 ° F.; No. 3—92. ° F.; No. 4—91.1 ° F.; No. 5—91.6 ° F. It seems safe to justify this conclusion when it is known from later observations that broodrearing can continue at lower temperatures than 93 ° F. which is usually given as the broodrearing temperature. It appears, however, that the higher temperatures above 91-92 ° F. are necessary to stimulate broodrearing. For some of these colonies it is very likely that broodrearing was discontinued before the next general flight period of April 5, judging from the highest temperatures of 81 °, 80.2 ° and 81.9 ° F., in Colonies Nos. 1, 2 and 4, respectively, on March 31. A high temperature of 90.6 ° F. in Colony No. 5 on the latter date, as well as the activity at the entrance of No. 5, on March 21 probably indicated broodrearing still in progress in this colony. Later observation in 1924 tends to confirm these results. The colony in the bee cellar, very likely, started broodrearing in February since temperatures above 90 °

F. were recorded in the hive during that month. This, no doubt, was the result of maintaining too high temperatures in the bee cellar.

A study of the spring temperatures of the brood nest, as shown by Table 1, gives conclusive proof that broodrearing in early spring takes place at temperatures much below the orthodox point of 93 ° F. The records show that on April 11, none of the colonies had temperatures above 90.2 ° F., with the lower limit of the brood area being as low as 76.3 ° F., in Colony No. 2 without any packing. This information served as the stimulus for a study of the variations in the rate of development of the honey bee, as given later in this paper. However, as the season progressed, the weather becoming warmer, and the colonies more populous, the temperatures of the brood area generally varied from about 90.0 ° to 95.0 ° F. These limits varied considerably during the extremes of weather conditions, as shown on May 8, when Colony No. 2 had a temperature of 83 ° F. in part of the brood nest. This showed that lack of protection prevents the maintenance of the usual high temperature. During the spring period, temperatures of 85 ° F. were of common occurrence on the edges of the brood nest, where the thermocouples were not entirely surrounded by brood. The queens apparently extended their egg laying activities to points colder than 90 to 95 ° F. As will be shown later, these colder temperatures retard the development of the brood. Lack of ventilation and retention of heat by insulation also have an important effect upon the temperatures of the brood area as shown on June 1, when Colonies Nos. 1, 4 and 5 had high temperatures of 96.6 °, 96.3 °, and 97.5 ° F., respectively. The hanging out of the bees on the packing cases showed that these high temperatures were not desirable conditions. The heavy insulation serves a good purpose during the earlier spring period, protecting the colony from the extremes of cold weather, but would no doubt lead to excessive swarming unless adequate ventilation was provided to reduce the heat of such protected colonies. Partial proof for this statement is shown by the fact that Colony No. 4 did cast a swarm on June 18.

Examining the broodrearing records for the spring of 1924 we find other indications that a slight flight period is the stimulus for beginning of broodrearing. A colony wintered in a double-walled hive had a good flight on March 27 although it had only slight flights on March 3 and 5 and a fair flight on February 27. When examined on April 9 broodrearing was in progress but with only two cells of capped brood. The temperature records for that date show its highest point to be 89.9 ° F., which could easily account for the delayed capping after broodrearing was stimulated by the slight flight of March 27 in which the bees probably did not raise their temperature to a point stimulative of broodrearing until the day following.

A colony without packing showed all stages of brood from eggs to pupae with pink eyes (14 days old), then a break in the series, to a few cells of quite dark pupae on April 9. As the latter were about ready to emerge on April 12, counting back 21 days we see that the eggs were laid about March 22 which date this colony obtained a flight. Fourteen days back from April 9 gives March 27 the date of flight. Apparently there had been a break in egg laying between the two flight dates of

February 22 and 27. This colony had no doubt been stimulated to broodrearing by a flight on February 27 when a high temperature of 91.0 ° F. was recorded and again on March 3 at 91.2 ° F. However, egg laying was not continuous thereafter because of evidence previously given. Apparently the flight periods of February and March stimulated starting of broodrearing although not continuous, while flight periods of December and January were not stimulative. The following highest temperatures of the cluster recorded for this colony after flights would seem to bear out this conclusion: Dec. 8—85.5 ° F.; Dec. 14—71.8 ° F.; Dec. 17—86.4 ° F.; Dec. 18—86.4 ° F.; Dec. 19—77.6 ° F.; Jan. 23—82.7 ° F.; Jan. 31—79.1 ° F.; Feb. 27—91.9 ° F.; Mar. 3—91.2 ° F.; Mar. 22—91.7 ° F., and Mar. 28—91.1 ° F.

A colony packed with 10½ inches of shavings showed worker brood just emerging on April 12, indicating that the flight of March 22 had been the stimulation although the high point of the cluster for the period between March 3 and March 24 when recorded showed highest temperatures of 88.4 ° to 90.0 ° F. with 92.4 ° F. on March 27. Broodrearing may have been continuous because of the heavier insulation and consequently more uniform temperature during March.

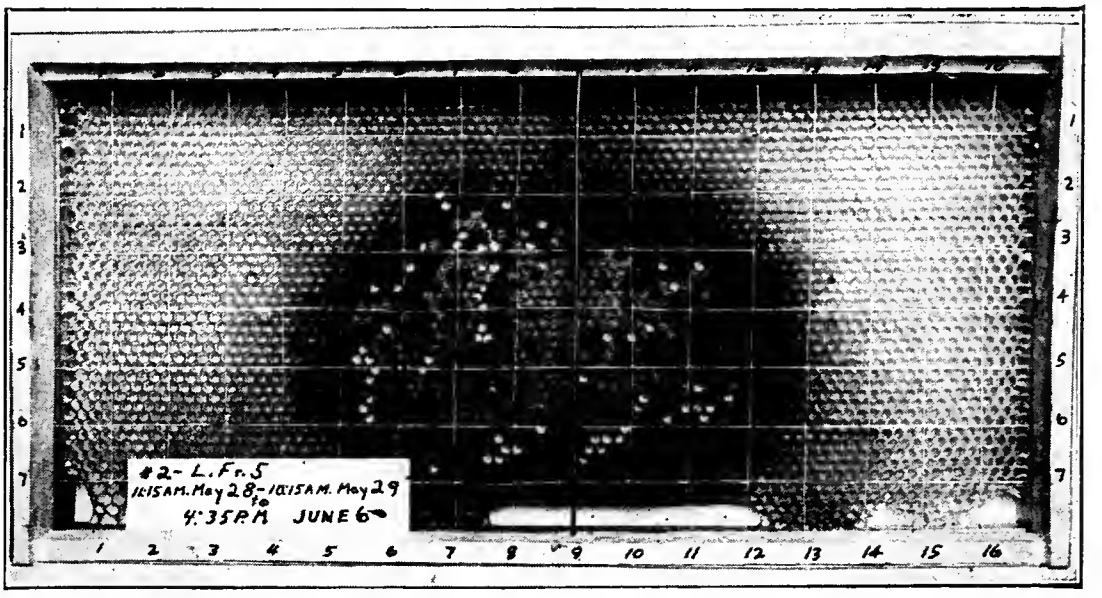
For this same colony, the records of April 12 seem to prove that there was a lapse of egg laying during the first few days of April since there was no brood in the intermediate stages between larvae about half filling the uncapped cell to prepupae stretched in the cell. Eggs laid from April 1 to 4 would have supplied this age of brood. Although this colony started flying on April 2, pollen was observed to be first carried in on April 4, which probably was the exciting cause for continuing broodrearing. Since in the beginning it was not intended to study the effect of pollen on broodrearing, no records were kept of the amount of pollen in the hive, but the amount was probably very small on April 1, since the colony was given stores the previous fall by inserting five full frames of white honey for the outside frames of the hive, which contained little if any pollen.

The records of this last colony were duplicated by another colony with 6 inches of packing, excepting slight differences in highest temperature readings.

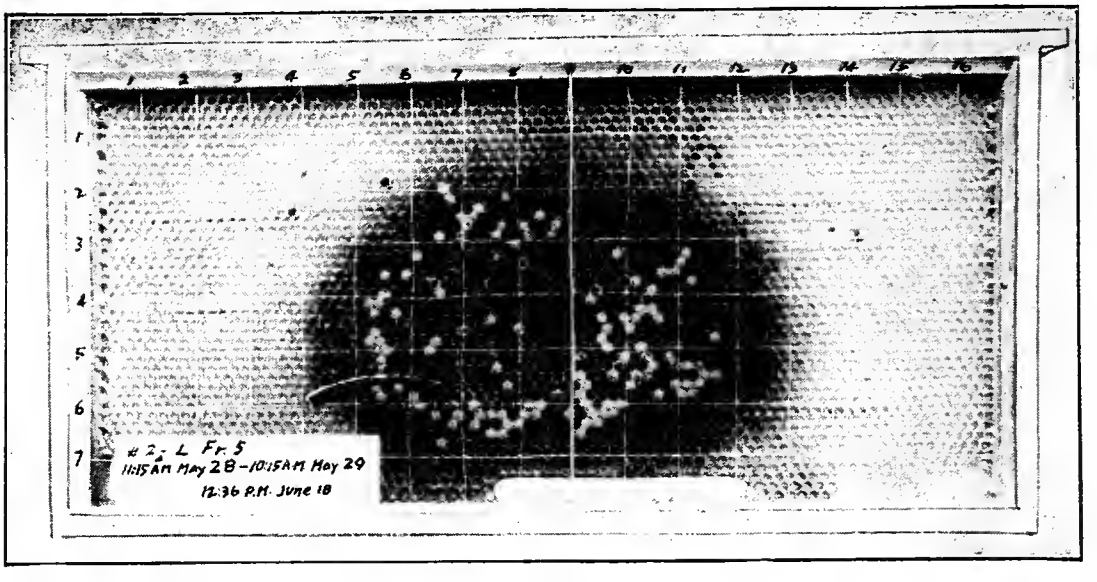
Variations in Development of Honey Bee.

With the facts from the 1923 records previously given in mind, the question arose as to the amount of variation in the periods of the developmental stages under the extremes of temperature of the brood nests. The survey of the literature upon this question as given in the first part of this paper shows many differences of opinion among the earlier writers although many suggested variations depending upon the weather or temperature. In recent statements upon the subject, 16, 21 and 24 days are given as the length of time for the complete development of the queen, worker and drone honey bee, respectively. To gain further information experiments on the periods of development of the worker honey bees were conducted during the summer months of 1924 and 1925 with colonies each equipped with 44 copper-constantine thermocouples or thermometers.

In the 1924 experiments, frames of worker eggs were obtained by inserting brood free frames into the centers of strong colonies of bees for approximately 24-hour periods. The number of eggs laid that actually completed development as determined by counts made from photographs varied from 82 to a maximum of 803 or a total of 4,094 on the nine frames used, as indicated in Plate I. At the end of the egg



(A)



(B)

Photographic record of worker brood development. (A)—As the brood was being capped. (B)—As the young bees were emerging.

laying periods these frames were inserted at definite positions in the brood nest of the experimental colonies with different degrees of protection and hence of temperatures maintained within their respective brood nests. These frames were kept surrounded with brood of all ages, to avoid neglect but the queens were confined to the upper body to prevent further egg laying.

At the time of capping of the brood the frames were removed and photographed on successive days until all cells were capped and then again at the time of emergence. In photographing, the frames of brood were taken into the warm laboratory to prevent chilling, and were photographed behind a dummy frame marked off by wires into inch squares which facilitated the counting of the individuals at a later time. Because of lack of time, the colony temperatures were usually recorded not more than once each day although at various hours. The temperatures given in the tables of Plates I and II are the averages of these daily readings during the developmental periods which are probably quite relatively correct.

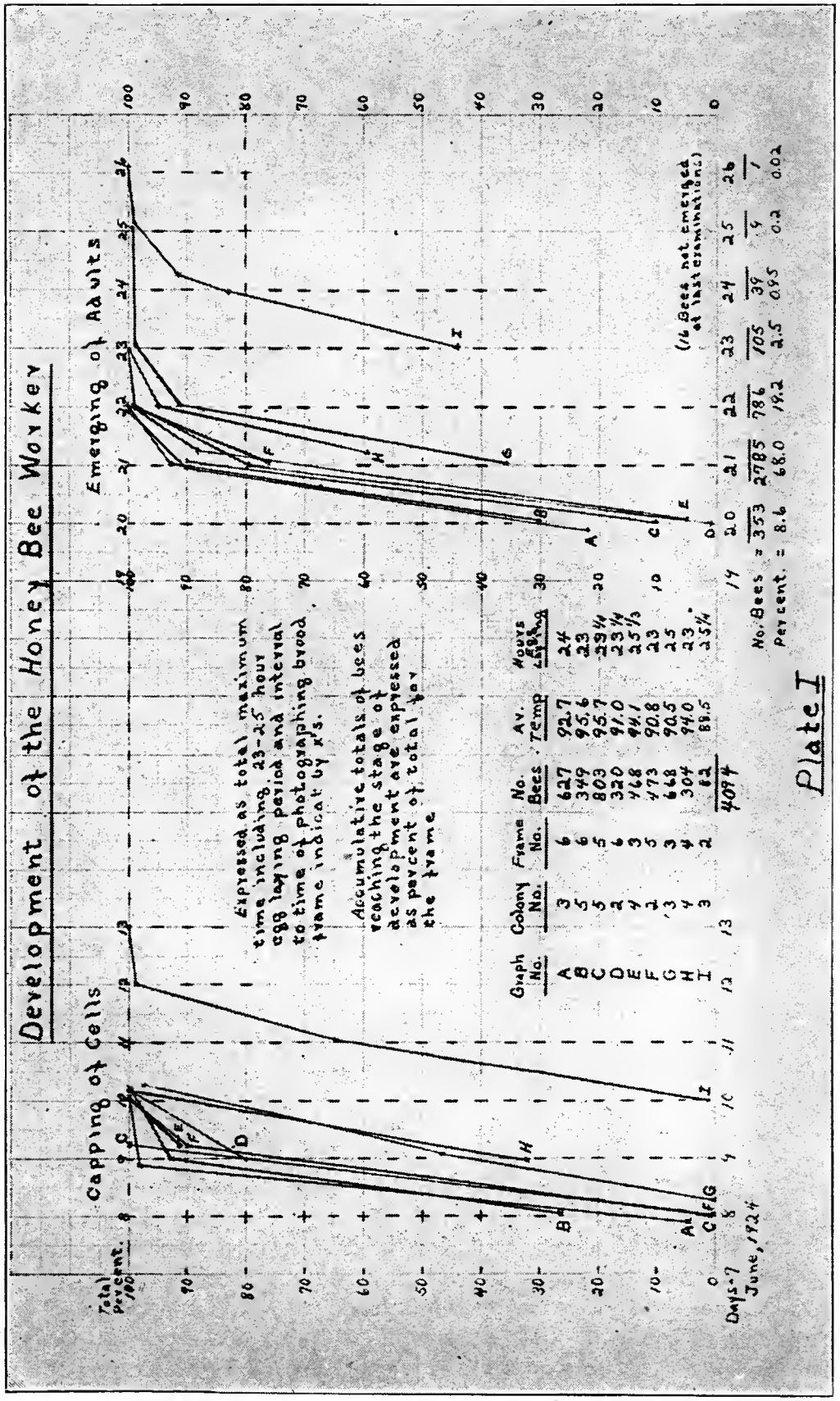
Plate I is an attempt to graphically represent the data obtained in the 1924 series of experiments. At the left the time of capping of the worker cells and at the right the time of emergence is indicated, each separate line representing the bees on the particular frames designated by letters A to I. The information as to the colony and the particular location of that frame in the hive are given in the chart in the bottom center of the Plate. Additional information given there is the number of bees per frame, the average temperature of the thermocouples surrounding the brood during the period of development and the period of egg laying.

The accumulative totals of bees on each separate frame reaching the particular stage of development at the time the photographic records were made are graphed against the periods of time in days from the laying of the eggs which is the maximum possible time. Owing to the long period of egg laying used in 1924 (23-25⅓ hours) and the 24-hour periods between most of the daily examinations the information obtained is not very definite.

However, a study of Plate I will show that between 70 and 98% of the bees on frames A to G were capped over in less than nine days, even counting the entire egg laying period, while on frame A, 28 cells or 4.4% were capped in less than seven days and 22 hours. Many cells on Frame B were probably capped in less than eight days since 26.3% or 92 cells were sealed before a maximum time of eight days and 1½ hours. On the other hand with Frame I, only one cell had been capped at the maximum of ten days and the last cell of 82 on the frame had not been sealed at the end of twelve days and fifteen minutes. Even if this particular egg were laid at the end of the egg laying period, it could not have been capped in less than ten days and twenty-three hours.

For the maximum time required for emergence of adult worker the graphs at the right of Plate I show that 8.6% of the total of 4,094 bees emerged in less than twenty and one-twelfth days, while an additional 68% had emerged in a maximum period of less than twenty-one and one fourth days. With Frame A, of a total of 627 bees, 137 or 21.8% actually emerged in less than nineteen and seven-eighths days. With Frame I, with an average temperature of 88.5 ° F., no individuals had emerged in twenty-two days, while the last bee required at least twenty-four and one-twelfth days.

Further experiments were conducted in 1925 along the same lines, but the period of egg laying was reduced to exactly six hours, the num-


Development of the Honey Bee Worker
Capping of Cells
Emerging of Adults
Total Percent
Days-?
June, 1924
Expressed as total maximum time including 23-2.5 hour egg laying period and interval to time of photographing brood frame indicated by x's.
Accumulative totals of bees reaching the stage of development are expressed as percent of total bee in the frame
Graph No. | Colony No. | Frame No. | No. Bees | Av. Temp | Hours Lapsing
A | 3 | 6 | 627 | 92.7 | 24
B | 5 | 6 | 349 | 95.6 | 23
C | 5 | 5 | 803 | 95.7 | 23¼
D | 2 | 6 | 320 | 91.0 | 23¼
E | 4 | 3 | 468 | 94.1 | 23½
F | 1 | 5 | 473 | 90.8 | 23
G | 3 | 3 | 668 | 90.5 | 25
H | 4 | 4 | 304 | 94.0 | 23
I | 3 | 2 | 82 | 89.5 | 25¼
4094
No. Bees = 353 2785 786 105 39 9 1
Percent. = 8.6 68.0 19.2 2.5 0.95 0.2 0.02
(16 Bees not emerged at last examination.)
Plate I

Development of the honey bee worker—1924.

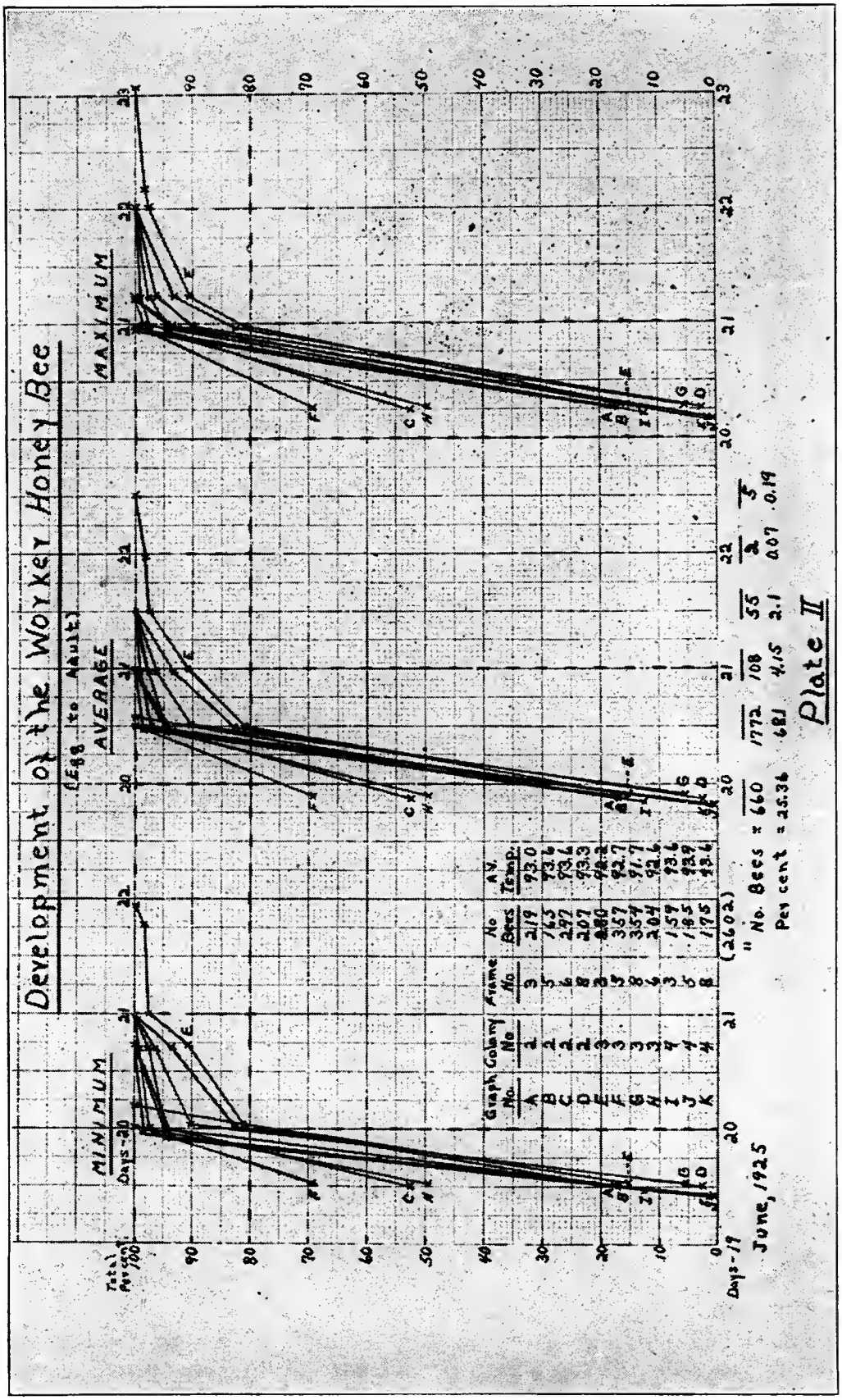
ber of eggs obtained on the eleven experimental frames varying from 159 to 357 with observations on a total of 2,602 bees actually recorded, as shown in Plate II. Three colonies were used for developing the brood, but owing to the strength of the colonies and the favorable weather conditions the variations in temperature were not as great as in the 1924 experiments, hence the limits of the complete developmental periods cannot be expected to be as great.

In preparing Plate II, the minimum, average, and maximum periods of development for each group of bees emerged are graphed separately. The minimum curves are partly theoretical in that the beginning point of each curve was arbitrarily set by subtracting eighteen hours from the maximum for each particular group of the first emerged bees. Likewise, the beginning points of the average curves are partly theoretical since they are the average of the theoretical minimum and the true maximum. However in both the minimum and average curves the second points and all intervening to the last point are exactly true. The error induced by this arbitrary method is shown by the observation for one particular Frame J of this group on which the first bee was starting to gnaw the capping at the first examination and at the last examination the last bee was just crawling out of its cell. In this case the method used gave an error of twelve hours for the minimum curve and six hours for the average, but owing to larger numbers of bees having emerged on the other frames at the first examination, the errors are not as great for these beginning points.

No records were kept of the time of capping of the brood but the smallest maximum period recorded for complete development was twenty and one-sixth days for two bees on Frame K. On the remaining frames numbers of workers varying from five to 247, a total of 660 or 25.3% had emerged at the first examination or in a maximum period of twenty days five and one-fourth hours to twenty days six and two-thirds hours. No doubt, many of these bees, such as those with the greater number emerged at the first examination (H, C, F.) actually required less than twenty days.

As shown by the maximum curve on Plate II, of the eleven frames in the 1925 experiment, all had 81% or more of the workers and all but two (E, D.) had between 90 and 100% of their totals developed in less than twenty days twenty-three hours and fifty minutes as a maximum. The combined totals for all the frames show that 1,772 or 68.1% of the 2,602 emerged in less than twenty days twenty-three hours and fifty minutes, which added to the 25.3% emerging in less than twenty and one-fourth days gives a combined total of 93.4% emerging in less than twenty-one days. Since the second points are correct for the minimum and average curves of Plate II, the conclusion can be drawn that 93.46% of the bees under experiment had completed their development in an average time of twenty and one-half days.

As in the 1924 experiments, one frame in particular showed considerable lengthening of the developmental period. While at least 43 bees or 15.3% of the bees on Frame E emerged in less than twenty days six and two-thirds hours, one unemerged bee was active beneath its cap-



Development of the honey bee worker—1925.

ping after a minimum period of twenty-two and three-fourths days. The decreased temperatures surrounding this frame undoubtedly accounts for the brood requiring a more variable period for complete development than in the other frames having a higher and perhaps more uniform temperature from the center to the edges of the frames. The variations for the complete development of brood from the center to the edge of all the frames is, without doubt, mostly due to a temperature relation, for the variation in the time of deposition of the egg when confined to a six-hour period, could not account for the greater variation in the total length of the developmental period. It must also be admitted that a part of the variation in the development is probably due to difference in the attention given to the larvae and the consequent amount of food given each, especially those around the edges of the brood nest.

It is evident that the decreased developmental periods are associated with the stronger colonies with the greater average cluster temperature, and that even in these stronger colonies there is a variation in the colonies from the center of the frames to the periphery of the brood area on it and from center frames to outside frames. Likewise the periods of development are increased with weaker colonies with lower temperatures in the brood nest, and from the center to the periphery of the brood nest.

Summary and Conclusions.

Summarizing the information given in this paper we may say that flights in the earlier part of the winter do not stimulate the colony to broodrearing, yet after a period of quiescence flights in late February, March and April usually stimulate colonies to begin broodrearing regardless of whether pollen is carried in by the bees or not. However, broodrearing may not be continuous from then on through the spring period, but is dependent upon the supply of pollen and honey in the hive and the ability of the bees to take further flights to gather supplies of nectar, pollen and water which are essential.

Temperatures up to 91 ° to 92 ° F. are apparently necessary to stimulate the beginning of broodrearing but maintenance of such a temperature is not necessary for a continuation of broodrearing. Temperatures as low as 76.3° F. were found in the brood nest with apparently no other ill effects than that of retarded development. Temeratures of 85 ° F. in parts of the brood nest are not uncommon during the spring period, although after broodrearing is once well established in the late spring and summer, the brood area generally ranges from 90 to 95 ° F. A temperature of 98 ° F. was the highest ever recorded in a colony by the author. Temperatures above about 95 ° F. tend to cause the bees to hang outside the hive with loafing which eventually results in swarming.

The development of brood is proportional to the temperatures surrounding the bees, any increase or decrease from the normal developmental period being spread over the egg, larval and pupal stages of all

three sexes of bees. In any given colony the shortest periods of development are those of the brood in the center of the combs of the center of the brood nest, the length of time increasing for the brood toward the periphery of the brood nest or that brood on the lower edges of the frames and in the outside frames. The amount of feeding by the nurse bees may influence the developmental period, depending upon the strength of the colony and the relative amount of nurse bees and brood.

The experiments herewith reported show that worker brood may be capped during the eighth day from the laying of the egg, or in less than eight days, with the majority during the ninth day of development, and some requiring as much as eleven days before being capped. Considerable individual variations are common. Some cells may be capped several hours before others in the immediate vicinity, probably due to differences in the rate and amount of feeding by the nurse bees. The complete developmental period for worker bees varied from less than nineteen and seven-eighths days to more than twenty-four days for complete development from egg to adult. In one set of experiments, 74.6% emerged in a maximum time less than twenty-one and one-fourth days, while in a more definitely controlled experiment, 93.46% emerged in less than twenty-one days or an average developmental period for this portion of twenty and one-half days. At the higher temperatures, all bees in some frames had emerged in less than twenty-one days, while in some cases of colder temperatures all bees required more than twenty-one days for complete development. It is reasonable to assume that the development of queens and drones is as closely related to the temperature environments, although in a natural state they are usually produced at a time of the year when the atmospheric temperatures are highest.

From a practical point of view, these brood experiments suggest that all colonies should be provided with sufficient protection during the early broodrearing period in order that a uniformly high temperature may be maintained within the brood nest. Stronger colonies will also aid in the general proposition of maintaining high temperatures and in providing a sufficient force of nurse bees to properly care for and feed all the larvae that may hatch from the eggs laid by a prolific queen. With a decreased developmental period, a more economical use of the brood nest is made possible, with a consequently greater force of bees to take advantage of a good honey flow when it arrives.

Interstate Beekeepers' meeting, LaCrosse, Wisconsin, August 14-16, 1929.

AMERICAN HONEY INSTITUTE.

(Report—February 3, 1930.)

DR. H. E. BARNARD, *President.*

MALITTA D. FISCHER, *Honey Specialist.*

American Honey Institute has been in existence about a year and nine months. During the first nine months of its work special attention was given to the drafting of practical plans for immediate development. It is obvious that no program of national scope which concerns an industry composed of large numbers of individual producers can be quickly organized. The work of the Institute was therefore in those first months of its efforts devoted to bringing together in some definite form the influences which could be expected to show an interest in honey as an important food.

The Institute has made real progress and it is impossible to give all the details of the results it has obtained in this report. The work this past year was composed of the following:

HONEY HELPINGS.

The most extensive work carried on by the Institute was in the field of HONEY HELPINGS. Honey Helpings is the title of the Institute Clip Sheet and is prepared bi-monthly on subjects having a seasonal application. Each number contains recipes for the use of honey. The numbers thus far prepared are:

No. 1—Honey for the Easter Dinner—mailed March, 1929.. 500 run
No. 2—Honey for Spring Combinations—mailed May, 1929.. 750 run
No. 3—Honey at Preserving Time—mailed July, 1929.....1,000 run
No. 4—Honey for School Children—mailed Sept., 1929.....6,000 run
No. 5—Honey Helpings for the Holidays—mailed Dec., 1929.5,000 run
No. 6—Honey Helpings for Breakfast—mailed Jan., 1930...1,000 run*

The numbers planned for till July, 1930, are:

No. 7—Honey Muffins—to be issued March, 1930.
No. 8—Picnic Treats—to be issued May, 1930.
No. 9—Frozen Desserts—to be issued July, 1930.

When the first number was run, it was decided to mail these honey suggestions to only home economic teachers, nutrition field workers, syndicate column writers for home pages in newspapers and magazines, radio household chat directors, our directors, members of the institutes

* More to be run depending on requests.

and secretaries of state beekeepers' associations. Five hundred copies of the first number was thought ample. Of this number three hundred were mailed to the teachers and the remaining two hundred held in reserve for requests. The requests climbed readily and it was found necessary to run seven hundred and fifty copies of the number two in May. The mailing list was extended to five hundred and two hundred and fifty held in reserve. The requests increased faster than ever and it was decided to run one thousand copies of number three—the preserving number mailed in July. By this time requests were coming from beekeepers. Beekeepers wanted to be placed on the Institute mailing list and thus when September came and the Honey Helpings for School Children was prepared, the requests mounted so from teachers everywhere (including demonstration agents, commercial food workers, dietitians) and beekeepers were insistant in their desire to have the Institute send them this material in lots of fifty to five hundred copies. It was found practical to work out a plan where this material would be distributed to teachers in lots up to twenty-five gratis and to bee keepers in lots up to five hundred at cost.

Beekeepers are reporting that Honey Helpings are bringing in repeat orders and the Institute is hopeful that the plan may be extended. Approximately three thousand copies have been sold to beekeepers since October first, 1929, to date.

The Institute's present mailing list is made up of requests except that home economic directors, state association secretaries, Institute members, beekeepers donating honey, Institute directors and beekeeping journal editors are included. By sending to only those teachers, food workers and housewives who request material we are pretty sure that the honey recipes are getting into the hands of those who are really interested.

Food workers are interested in honey recipes. The Institute receives letters every day from some teacher, some writers, some housewives expressing favorable comment. In addition to the mailing list about twenty-five hundred have been sent out to extension workers and teachers for distribution to their students.

Special Honey Stories.

Food workers who have been receiving Honey Helpings have been impressed with the attractiveness of such copy and have asked the Institute to prepare honey copy with recipes exclusively for their paper or magazine. They have been insistant that such material be exclusive, not syndicate copy. To date such material has been prepared for six magazines, four newspapers, one syndicate, and seven food companies.

Special Service to Beekeepers.

Beekeepers are asking the Institute everything; i. e., how to bottle their honey, how to get local grocers to market honey candies, poster designs, list of buyers, lists of bakers, equipment necessary to start making honey candy.

The Institute office staff is very small and it has not always been possible to answer these requests promptly but in every case, an effort was made to send the beekeeper the information he requested. It is impossible to keep up a marketing department and so all requests for honey buyers are referred to the U. S. Department of Beekeeping. The Institute feels it can be of much more service to the beekeepers by working with the food teachers.

The Institute has been able to interest home economic teachers in starting honey projects in their cooking classes. Where such interest is shown, the Institute tries to get the local beekeepers of that city to donate honey to the teacher for this work. The Institute furnishes beekeepers honey receipes as well as special honey copy for local newspapers and radio broadcasting. Honey Helpings are furnished at cost of paper and mimeographing.

Cooperative Food Advertising.

Foods are now advertised in the form in which they are eaten rather than under a trade name which stresses brands. No food is better adapted for uses with other materials than honey and the Institute is calling to the attention of advertising firms and food manufacturers the great value of using honey to bring out the value of the particular product offered for sale.

The Institute has gone one step further. It has taken various food products and experimented with them in honey recipes and then sent such recipes to the various companies putting out these products. Much favorable response has been received.

For example, take this recipe booklet just issued by the Sunkist Fruit Growers Association. They included a honey fruit recipe furnished them by the Institute (see page 15). It took over a year to get this cooperation, but when one considers that this booklet gets into thousands of homes, the effort is indeed worth the result.

The companies including honey recipes in their printed material are:

Edwards Company.
Evaporated Milk Association.
Pabst Corporation.
Supermaid Cookware.
Sunkist Fruit Growers' Exchange.
Chicago Gas and Coke Company.
Mount Hope Farm.
Ottawa Gas Company.
Quaker Oats Company.
The Kellogg Company.
Crisco Company.
Washburn-Crosby Company.
Fleischman Company now Standard Brands.

"Honey in the Bakeshop"—you are all acquainted with this booklet containing honey recipes especially applicable to bakery products. Bakers everywhere are interested in quality products and will use honey when they learn how. Had it not been for the cooperation of "Bakers' Helper" it would not have been possible to issue this booklet or secure so much free publicity.

The restaurant people through their official magazine, the confectioners' and soda fountain interests through their national journal will

in time be ready for a honey booklet adapted to their needs and the Institute hopes to work out a reprint plan for the articles prepared for them as was done with Bakers' Helper.

Radio Contacts.

Last June a form letter was sent to 102 radio stations asking if such stations had household chat hour directors and offering such workers the service of the Institute. The result was that a number of contacts were developed which resulted in honey recipes being included in recipe broadcasts. The directors for such recipe broadcasts have been sending all requests for honey recipes to the Institute thus giving it the opportunity to get directly in touch with women interested in the use of honey.

Honey Research.

At the last board meeting, projects were outlined for special honey research to be carried on at the Medical School of the University of Minnesota. The progress thus far made will be reported by Washington officials.

The Institute is keeping in touch with all government laboratories carrying on investigations with honey. Wherever possible or where it may be helpful, conferences are held with the investigators.

Another branch of honey research is being carried on by food companies and here, too, the Institute helps to stimulate the combination of honey with the products of such companies. The Institute makes suggestions to food companies for the combination of honey with their products and in many cases such suggestions have led to the starting of experimental cookery in the testing kitchens of such companies.

The Institute in its own laboratory has been working with honey combinations and when more time is available for such work, more of such experimental cookery will be carried on.

International Developments.

Within the past month letters have come in from many foreign countries asking how their beekeepers may come into the Institute and follow its program in their respective countries.

The Institute's answer to Mr. Ecroyd's letter states that the Directors would consider this matter carefully and work out if possible some arrangement for foreign subscription.

News Notes.

Institute News Notes have been in part responsible for the increased interest beekeepers have shown in the Institute's program. You know what they are. This material is sent to our directors, members, journal editors and state association secretaries. Requests for News Notes are coming in from other trade associations and it may be advisable to extend the mailing list for this material.

Attendance at Meetings.

The Institute has attended a few meetings this past year but has refused many more invitations than it has accepted. The most important group of meetings is probably the national food and health groups. Practically our entire travel allotment was spent in attendance at such meetings for it was thought more accumulative honey advertising could be secured through exhibits, demonstrations and attendance at them than any other type of gathering. The Institute was very much pleased with response continually being received from its attendance at the American Home Economics Association, American Public Health Association, American Dietetic Association and National Restaurant Exposition.

Scientific and technical conventions are also very important and our president attends a large number of such gatherings. The progress being made by our scientific groups clearly brings to our attention possibilities for introducing honey.

Beekeepers are just naturally hospitable and invitations have come from beekeepers' organizations almost in every state of the Union and Canada for Institute representatives. Many of the meetings could have been attended had the budget permitted but in many cases where state associations offered to take care of the entire travel expense, the Institute had no representative available. Various commercial companies offered to have their representative discuss the Institute at beekeepers' meetings attended and this plan has been very helpful.

Special conferences have also been attended by the Institute particularly conferences concerning national legislation. Fortunately, our president's work keeps him in Washington at such times when he can attend conferences concerning government legislation. In this connection our directors have been informed from time to time of the corn sugar legislation, the bee census situation and the conferences on these matters that our president has attended.

Future Work.

Every field of the Institute's work reported on today needs further development and the staff is hopeful that it can be done. Just briefly may we consider extension possibilities.

I. *Honey Helpings.* The mailing list of this work needs to be much improved. Valuable contacts are being lost just because the staff is not ample to take care of properly extending this work.

The copy for these clip sheets has not been what it should be because in many cases it was too hurriedly mimeographed. A better system of preparation and mailing would be possible with a more ample force.

More honey recipes must be worked out. Take the clip sheet to be issued on Frozen Desserts, much more testing of honey in such combinations must be carried on before this number can be run.

II. *Special Honey Stories.* It is particularly important that this field be enlarged. Papers and magazines all over the country are carry-

ing home pages and menu suggestions with recipes. Honey copy should be found on these pages and the Institute can get these food page editors to include honey material if it has time to carry on a follow-up program and adapt the copy to their needs.

III. *Special Service to Beekeepers.* Beekeepers need help in planning local programs, not meeting programs but programs with their domestic science teachers in starting honey projects with their cooking classes, demonstrational projects at their local stores, exhibits at county fairs and the like. The Institute could help these beekeepers if the staff was ample.

IV. *Cooperative Food Advertising.* There is no question about the value of extending this type of work. The Institute has made a good start and it is just a matter of having a larger force to get into the various sections where food companies are interested.

V. *Radio Contacts.* So little work has been done with the radio household chat directors, that this field offers unlimited possibilities. The Institute feels confident that much valuable advertising is being lost with household chat directors because of an inadequate number of workers to develop contacts.

VI. *Honey Research.* VII. *International Developments.* VIII. *News Notes.* IX. *Attendance at Meetings.* All of these fields need more extension but are just in the formation and will be developed as the staff is increased.

An Ideal Institute Staff.

President.

Honey Specialist.

Two Office Assistants—one a stenographer, the other a clerical assistant.

One Extension Specialist—home economics student to visit colleges, demonstrate honey uses at home economics classes, cooperate at cooking schools, and so on.

HONEY HELPINGS.

New Uses for Our Oldest Sweet—Different, Dainty, Delicious.

(Suggested by American Honey Institute.)

DRIZZLING HONEY.

In these recipes you will notice *drizzle* honey, and *slightly warmed* honey. Honey drizzled is better than honey *poured* for a little gives just the sweetness desired and intensified natural flavors; a lot of thick honey poured on makes any dish too sweet. Place the honey jar in *warm* not hot water for about ten minutes before using. When you're ready to add to food, it is just right consistency to drizzle tiny threads instead of pouring a heavy stream.

BREAKFAST FRUITS.

All fruits to which sweetening is added for serving are delightful when honey-drizzled. The flavor of citrus fruits has a new tang and intensity when honey-sweetened, that is particularly refreshing and appetizing.

Grapefruit—Prepared thus, starts your morning right: Half the grapefruit, remove core, and divide sections as usually prepared. Pour over the fruit 2 or 3 tablespoons honey; let stand 15 to 30 minutes before serving.

SALADS.

In fruit salads honey is in its glory. Just drizzle honey on fruit slices arranged for serving and watch the honey penetrate the fruit tissues—it's part of the whole in a minute. There's a reason for this harmony; the sugars in fruit and in honey are natural sugars so they blend perfectly. Drizzled honey is the simplest way to dress salads—to give them new, inviting flavor. Try this *Barnard Favorite* for cooling satisfaction on a hot summer day; peel and slice crosswise, firm medium sized oranges, allowing 4 or 5 slices for each salad. Arrange crisp lettuce on individual dishes. Have slightly warmed honey in a saucer—shredded cocoanut in another. Dip orange slices in honey (both sides); then in cocoanut; arrange on salad plates. Heap halves of sweet red cherries or berries in center where orange slices meet; drizzle a bit of honey on fruit in center; serve cold.

CHOICE DESSERTS.

Drizzled over ice cream—topped with cherry, nuts, or rice krispies—honey makes delicious *sundaes*. For variety, fresh fruits and honey combined—berries, peaches, pineapple—sundae dressings limited only by your imagination. *Sauces* of fresh or cooked fruits, sweetened with honey, are pleasing, healthful desserts. *Cakes and cookies* made with honey—baked when convenient, ready when needed—may be kept on hand constantly for use on busy days or for surprise guests.

HONEY DATE BARS.

Three eggs well beaten; mix with 1 cup honey, 1 teaspoon baking powder sifted into 1 1/3 cups flour; then add pinch of salt, 1 pound chopped dates, 1 cup chopped nuts. Bake in moderate oven about 45 minutes in long

flat tin (mixtures spread ¼ to ½ inch thick). Cut in strips; roll in powdered sugar; pack in covered jar and keep at least 1 week before serving. (Excellent type for cookie jar).

A Tasty Date Bar Service—Place two date strips on a plate; top with 2 tablespoons of ice cream and over this drizzle a little honey; dress top with spoon of honey sweetened whipped cream and a cherry.

Sandwich Fillings.

Honey in sandwich fillings brings extra goodness to the lunch. Blend with cream cheese, chopped nuts, raisins and celery, chopped carrots, peanut butter, dates chopped (with or without nuts) and many other combinations. You'll find them all different and delicious; easy to make—yet most appetizing. In sandwiches—plain, rolled, ribbon, or tier—honey assures additional flavor, keeps the sandwich moist, and holds crumbly bread together. A good combination in new form.

Honey Pecan Bread Roll—Thoroughly blend 1 cup finely cut salted pecans with ½ cup slightly warmed honey to form spreading paste. Cut bread in slices full length of loaf (ordinary loaf cuts 5 lengthwise slices). Spread with butter, then with honey pecan paste, and roll as for jelly roll. Wrap each in waxed paper and tie to keep intact. Let stand an hour or longer; remove paper and cut each roll in 3 slices—each loaf used makes 15 rolled slices.

Vegetables.

Vegetables with their appetizing salts and health promoting vitamins are digestive aids and important "protective" foods. To bring out their best fresh flavor, add a teaspoon of mild honey for each cup of vegetable when adding butter and salt.

Beverages Iced or Cold.

Honey sweetened fruitades, iced tea or coffee are indeed refreshing. The amount of honey required depends on personal taste. Blend the honey with a bit of warm water, add to beverage and then ice. In hot drinks add as desired. Tea with trimmings, a la honey, is as good as it sounds.

Tea Wafers and Toast.

Toast spread with honey cinnamon paste, honey nut paste, honey fruit paste, makes a delightful tea or lunch service. Just mix spice, nuts, or fruit with honey to spreading consistency.

Honey Krisp Wafers—Butter-wafers or saltines; ¼ cup slightly warm honey; ¼ cup rice krispies, mix honey and krispies thoroughly; spread on wafers.

These suggestions and recipes for the use of honey are offered you by American Honey Institute, an organization which believes in the economic and nutritional advantage of the larger use of honey as a spread for children's bread; as a sweetening agent in the kitchen; as an important dressing for salads; as a fine flavoring for sandwich fillings; as a delicious sweet for choice desserts.

The Institute will gladly work with you in developing menus, working out new recipes and formulas, giving honey demonstrations, or furnishing outlines. Address Chamber of Commerce Building, Indianapolis, Indiana.

HONEY HELPINGS—FOR SPRING COMBINATIONS.

American Honey Institute, Volume I, Number 2, 1929.

Heavenly spring days are here—garden planting, bees humming, and fruit trees on dress parade. May days, with birds singing love songs and

the gentle rustling of young leaves creep fast upon us. It's spring time again, and what a time for entertaining.

Spring and summer introduce a great supply of fresh fruits and vegetables. Markets boast of gay and colorful fresh foods. And, naturally, these should appear daily in our meals.

Food combinations for spring menus served a la honey way have a tempting fragrance and rare flavor all their own. It's strawberry time, too, and the luscious red fruit should be used in as many meals as possible during the short season. Honey strawberry combinations are irresistible; that honey flavor in combination with the fresh berries leaves a memory that makes other flavors flat in contrast.

BREAKFAST.

Strawberries a la honey
Hot Corn Flake Muffins Comb Honey
Toasted Bacon
Coffee Tea Milk

LUNCHEON.

Chilled Fresh Fruit
Tomato Cream Cheese Lettuce Sandwiches
Fresh Lima Beans
Honey Strawberry Sundae
Iced Tea

DINNER.

Lamb Chops Stuffed Potatoes
Green Peas and Carrots
Hot Bran Muffins Whipped Honey Royal Cabbage Salad
Strawberry Short Cake
Coffee or Fresh Fruit Lemonade

STRAWBERRIES A LA HONEY.

Well cleaned, fresh berries. Warm, mild honey.

Slice berries through once, if large. Arrange in serving bowl or individual glass sherbet dishes and drizzle warm honey about. For medium tart taste, allow two tablespoonsful warm honey to each glass sherbet dish of berries served.

CORN FLAKE MUFFINS (18 muffins).

¾ cup corn flakes
¾ cup graham flour
1 tablespoon shortening
3 teaspoons baking powder
1 cup milk
⅛ cup honey
1 cup white flour
1 egg

Mix melted shortening with honey, add to one egg beaten lightly, then add milk. Stir in dry ingredients which have been thoroughly mixed. Bake in well-greased tins thirty minutes at 350 ° F.

CHILLED FRESH FRUIT (8 servings).

1 cup orange dices
1 cup pineapple dices
1 cup fresh peach slices
1 cup fresh strawberries
1 cup warm honey

Mix diced fresh fruit and pour over it the warm honey. Let stand for at least thirty minutes in refrigerator before serving.

TOMATO CREAM CHEESE LETTUCE SANDWICHES (6 servings).

12 slices bread
6 lettuce slices
Butter to spread
12 thin tomato slices
2 cakes cream cheese
2 tablespoonsful honey

Lemon and honey mix made of 2 tablespoons lemon juice and 2 tablespoons honey.

Butter the bread slices. Blend 2 tablespoons warm honey with 2 cakes cream cheese. This will give the cream cheese good spreading quality and not make the cheese sweet, but intensify its creaminess. Marinate lettuce pieces in lemon and honey mix a few minutes before using.

Spread 6 slices of bread with cream cheese and honey mixture. On each cream cheese spread slice place two thin tomato slices and then the lettuce piece that has been marinated in honey lemon mix. Top with other butter slice and cut diagonally.

Lima Beans.

Prepare lima beans as ordinarily when cooking fresh ones. Just before removing from fire, add 1 tablespoonful warm honey for each 2 cups of lima beans used. Add salt and butter as usually done.

Honey Strawberry Sundae (6 servings).

2 cups fresh whole berries
Pinch of salt
1 cup mild warm honey
Ice cream
Whipped cream

Mash lightly or cut the berries, add honey, stir, then add a pinch of salt. Chill and allow two tablespoonsful of this sauce for each serving of ice cream. Top with whipped cream sweetened slightly with honey (about 1 tablespoonful honey to each cup of whipped cream).

Iced Tea.

To 1 cup hot tea (brewed as regularly for ice tea) add 1 teaspoonful lemon juice and 2 tablespoonsful honey. Mix well and pour in glass half full of cracked ice.

Green Peas and Carrots.

Shell fresh peas and dice fresh carrots. Cook them separately in well covered kettles and over a low flame. When done, mix. Season with salt and butter. For each cup of carrot and pea mixture, add 1 teaspoonful warm honey. The honey will intensify the fresh vegetable flavor.

Bran Muffins (12 muffins).

1 tablespoonful shortening
½ cup honey
1 egg
1 cup milk
1¼ cups flour
3 tablespoonsful baking powder
¼ teaspoonful salt
2 cups all bran

Cream shortening and honey, add well-beaten egg. Sift dry ingredients and add alternately with the milk. Bake for half an hour in a moderate oven—365 ° F.

Royal Cabbage Salad (8 servings).

1 cup diced pineapple (fresh or canned)
1 cup diced celery
2 cups shredded cabbage
2 cups whipped cream
2 tablespoonsful prepared mustard
6 tablespoonsful honey.
1 tablespoonful lemon juice

Mix diced pineapple, celery and shredded cabbage. Mix honey, lemon juice and mustard and add this mixture to whipped cream. Then stir in pineapple vegetable mixture. Serve at once on beds of lettuce and garnish with ball of honey cream cheese mix (formula given previously).

STRAWBERRY SHORT CAKE (25 individual short cakes).

3 cups flour
1 teaspoonful salt
3 teaspoonsful baking powder
4 tablespoonsful shortening
3 tablespoonsful honey
1 egg beaten light
1 cup milk

Cut shortening into sifted dry ingredients until thoroughly blended. Add to this mixture 1 cup milk which has been thoroughly mixed with one beaten egg and the honey.

Roll to about one-half inch thick and cut in rounds about 2 inches in diameter. Bake in moderate oven (350 ° F.) about 25 minutes.

STRAWBERRIES FOR SHORT CAKE.

4 cups berries well cleaned
½ teaspoonful salt
2 cups honey
Whipped cream

Mash the berries, add honey, stir, and add salt. Chill and use 4 tablespoonsful for each short cake. Top with honied whipped cream.

HONIED WHIPPED CREAM.

To each cup whipped cream, add 2 tablespoonsful honey. Use 1 tablespoonful of honey-sweetened whipped cream for each short cake.

HONEY STRAWBERRY SAUCE.

2 tablespoonsful butter
1 cup honey
⅔ cup crushed berries

Cream the butter and honey. Add the crushed strawberries slowly until thoroughly blended.

FRESH FRUIT LEMONADE (2 glasses).

3 tablespoonsful lemon juice
6 tablespoonsful orange juice
1 tablespoonful pineapple juice
3 tablespoonsful honey
Pinch of salt
1 tablespoonful strawberries crushed as prepared for short cake

Mix lemon juice and honey; add remaining fruit juices and crushed strawberries, pinch of salt, 2 cups spring water and pour in iced tea glasses filled with cracked ice.

DRIZZLED RICE DESSERT.

Cooked Rice Bananas Honey

Use properly cooked rice that has been cooled. Make layer of rice not thicker than ½ inch. Drizzle warm honey over rice layer (about 3 tablespoonsful honey to layer of rice assuming layer is not greater than cup of rice would cover). Cover with sliced bananas and drizzle honey over these, repeat with layer of rice, drizzling of honey, layer of bananas and drizzling of honey. Chill at least one hour and serve with honied whipped cream. This dish may also be baked and served hot with honey fruit sauce or hard sauce.

RHUBARB MERINGUE PUDDING.

When rhubarb comes in pink and tender, you'll want to make this—

¾ cup water
1 cup fresh stewed rhubarb
1½ cups bread crumbs
1 tablespoonful butter
2 egg yolks
1 cup evaporated milk
½ teaspoonful salt
½ lemon, grated rind
½ cup honey
5 tablespoonsful honey

Whites of 2 eggs for meringue

Soak the bread crumbs in milk and water; add the ½ cup honey, salt, butter, lemon rind, and egg yolks. Pour into a pudding dish and bake in moderate oven until firm. Cover with the honey-sweetened fresh rhubarb. Make a meringue of the stiffly-beaten egg whites and five tablespoonsful honey. Heap on top of rhubarb and set in oven to brown.

HONEY HELPINGS—AT PRESERVING TIME.

American Honey Institute, Vol. 1, No. 3, 1929.

Nothing is more gratifying than long shelves laden with preserved and canned foods, the delicious products of summer vegetable and fruit gardens. In filling up the preserve closet, include an extra shelf or two for gifts. Many, many times you will find just what you want on this gift shelf to give to the friend with but a kitchenette apartment, some convalescent, a bachelor maid or the boys and girls at school. How they will enjoy an assortment of home-made honey jellies, jams, and relishes. Plan to have a few extra jars for your Christmas boxes or baskets. Even the bride-to-be would appreciate a few jars as a shower gift.

So many and so varied and so delicious are the honey jams, jellies, conserves, and relishes that we wish we could place a honey fairy in every home to help the housewife preserve the honey way. Few persons besides those who have actually tried it, have the slightest idea of the value of honey in making preserves and relishes. Most fruits have a much better flavor when honey is used. It is true, too, that honey preserves the actual color of the fruit, duplicating more nearly the original brilliance of the fresh fruit itself.

Honey is most satisfactory in canning and preserving and its flavor adds much to the finished product.

Cherry Jelly.

Crush cherries and cook slowly, without water, till tender; then strain through flannel bag or two folds of cheesecloth. The fruits should not be pressed if a clear jelly is desired. To two quarts of strained juice allow one quart of honey. Let boil until it double drops from the spoon. Strain and pour into sterilized jars. Let cool over night and seal with hot paraffin.

Strawberry Jelly.

Thoroughly crush 1½ quarts of fully ripe berries. Squeeze out juice, then drip through cotton flannel bag if sparkling jelly is desired. Measure 4 cups honey with 2 cups of juice into a kettle, stir and bring to boil. Add ½ bottle commercial pectin, stirring constantly. Bring again to a full boil and boil for ½ minute. Remove from fire, let stand one minute, skim, pour quickly, and cover hot jelly at once with hot melted paraffin.

Currant Jelly.

4 cups currant juice 3 cups honey

Boil rapidly to the jelly test, pour into sterilized glasses and cool. Seal with hot paraffin, as regularly done.

Apple and Raspberry Jelly

Extract apple juice in the usual way for making apple jelly. For one quart apple juice use 1 pint raspberry juice. Boil the combined juices 20 minutes, add an equal amount of honey and boil until it sheets from the spoon. Pour into sterilized glasses and cool.

General Suggestions for Jelly.

Crab-apple, apple, plum, quince, grape and currant jelly can be successfully made by using ¾ of a cup of honey to 1 cup of juice—half honey and half sugar may be used too. Boil the juice 10 minutes, add the sugar and bring it to boiling point. Add honey and cook to 220° F. Remove scum, pour into hot sterilized glasses and cover with paraffin.

Fruit Sauces.

Prepare the fruit, pack raw in jars, cover with honey syrup and process in a water-bath or steamer the required length of time. For strawberries, cherries and pineapple make sirup of 2 parts by weight of honey to 3 parts of fruit juice or water. For plums and peaches make sirup of 1 part by measure of honey to 2 parts of water.

PRESERVES.

Honey Sunshine Preserves.

Use a pound of honey for every pound of fruit, mix them, spread on platters, put platters in a box slightly higher at the back than the front, cover with glass and place in the sunshine on a bench. When preserves are thick, put in sterilized jars and seal.

Apple Butter.

2 qts. cooking apples
1 tablespoon lemon juice
1 pint honey
1 pint honey vinegar*
½ teaspoon ground cinnamon
Pinch allspice

Cook slowly several hours, stirring often to prevent burning. When thick, can in sterilized jars.

* Cider vinegar may be substituted for honey vinegar.

Plum Butter.

Rub 2 quarts of plums through the colander. Let come to boil. Add one quart honey and boil about twenty minutes. Stir frequently to prevent burning. Seal hot in sterilized jars.

Peach Jam.

3 pounds peaches
2 cups honey
1½ teaspoon whole cloves
3 tablespoons lemon juice
¾ cup peach juice
¾ teaspoon allspice
3 teaspoon broken stick cinnamon

Put spices in a cheese cloth; cook slowly all materials until of desired consistency. Remove bag of spices. Place while hot in sterilized jars and seal.

Tomato Preserves.

2 pounds ripe tomatoes
2 tablespoons lemon juice
1 pound honey
Pinch cinnamon

Cook until thick, seal in hot sterilized jars.

Ginger Pears.

Wash, pare, core, and cut into very thin slices hard underripe pears. To 4 pounds sliced pears allow 4 pounds honey, ½ cup water, 1 ounce ginger root cut into small pieces, 2 lemons using the rind (rind should be cut in

very thin strips). Simmer all materials very slowly until as thick as marmalade. Seal in hot sterilized jars.

Rhubarb Conserve.

1 qt. rhubarb cut small
1 qt. white currants
1 qt. red currants
4 lbs. honey
1 orange sliced
1 lb. raisins
1 cup nut meats

Simmer the fruit about ½ hour or until sirup is jelly like, add nuts, boil up and turn into sterilized jelly glasses and seal in usual way.

Bar-le-duc Currants.

The bar-le-duc of France is world-famous. It commands a high price which is justified both by its reputation and quality.

The seeds are removed from the currants by a method which mutilates the fruit very slightly and the fruit preserved in honey. A good way to remove the seeds is to cut a small slit in side of each currant and by means of a needle remove the seeds. Next weigh the currants and take an equal weight of honey. After bringing the honey to the boiling point, add the currants and allow them to boil for two or three minutes until the skins are tender. Care should be taken not to let mixture boil so violently as to destroy shape of fruit. If the honey is liquified too much because of the juice of the currants, remove them, cook the sirup to desired consistency and then again add the currants.

Currants may be preserved in honey without having seeds removed but the resulting preserve is not nearly so dainty and delicate.

Honey Spiced Pickles.

The plainest pot-roast dinner or pick-up cold meat supper becomes a tempting repast when accompanied by honey-spiced pickles or a tart chutney sauce. Honey-pickle combinations have an important place in the dietary. They do more than stimulate the appetite. They complement the heavier meats which we eat during cold weather and make these richer combinations more digestible because of their acidity. Be sure to exercise great care in selecting the products to be used. Fresh spices are essential.

Pineapple Watermelon Preserves.

Boil the following for 10 minutes: 1 pound honey, ¾ cup water, ½ rind of 1 lemon, 1 teaspoon salt, ½ teaspoon ginger, juice of 1 lemon. Add 1 pound watermelon rind cut into small cubes. Simmer gently for 3 hours. Add 1 cup crushed pineapple and cook 1 hour longer. Seal in jars.

Honey Cauliflower Pickles.

Remove all outside leaves and stalks, then wash cauliflower thoroughly. Break into small flowerets. Cook in boiling salted water for 12 minutes. Rinse in cold water; then pack the pieces in hot sterilized jars. Fill the jars with honey-spiced vinegar prepared as follows: 1 quart honey vinegar*, ½ cup honey, 1 teaspoon whole cloves; 1 teaspoon mustard seed; 1 teaspoon whole allspice; 1 teaspoon broken stick cinnamon; 1 teaspoon celery seed; 2 small onions sliced. Boil 15 to 20 minutes, strain and pour over sterilized jars filled with cauliflower. Seal while hot.

Honey Cucumber Pickles.

Two quarts cucumbers; 4 cups honey vinegar*; 2 cups honey; ¼ teaspoon ginger; ¼ teaspoon cinnamon; 1 teaspoon celery seed; ⅛ teaspoon allspice. Let come to a boil, pour over cucumbers and seal.

Chutney Sauce.

Run through food chopper 2 onions; 1 green pepper; ½ cup hot red pepper; 3 green tomatoes; 3 tart apples. Add 1 cup raisins; 3 cups finely diced or crushed pineapple; ½ cup honey vinegar*; 1 cup honey, juice of 1 lemon; ⅛ cup mustard; ½ tablespoon ginger; pinch of red pepper, and ⅛ cup salt. Simmer very slowly for 2½ hours. Seal in jars.

Honey Vinegar.

Honey vinegar properly made is of excellent quality. Use 2 pounds of honey and 1 gallon of water. Dilute the honey with part of the water to be used and then pasteurize by heating to about 200 degrees F. Scald the barrel or crock in which vinegar is to be made, pour in diluted honey and add the water. Use the purest water available to avoid contamination. If rain water is used, boil thoroughly. Add a little mother of vinegar or fruit juice to start fermentation, cover with a closely woven cloth to keep out dirt and prevent entrance of undesirable yeasts or bacteria. From 6 to 12 months are required for proper ripening.

HONEY HELPINGS—FOR SCHOOL CHILDREN.

American Honey Institute, Vol. I, No. 4, 1929.

Summer holidays are over and children are again in the harness for school routine. School work demands physical fitness and more than ever a child's activity and growth must be determined by the foods he eats.

"I have a notion," said President Benjamin Harrison, "that children are about the only people we can do anything for. When we get to be men and women, we are either spoiled or improved."

Is this more true of any other thing than our diet? It is the hardest thing in the world for most people to change their diet and so it is important that we cultivate tastes in childhood. School work demands physical fitness and at this time it is particularly essential that a child's meals be planned and apportioned carefully. Milk, cereals, both hot and cold, vegetables, fruits, protein combinations—all must be made up in interesting and enjoyable ways.

Honey helps to make many of the combinations more palatable and if a child will eat more of a food that is good for him when that food is made the honey way, that's the way to serve it. Honey is an energy producing food serving as fuel for muscle activity and as well contributing small amounts of phosphoric acid, lime, nitrates, sulphates, carbonates, combined with salts of lime and iron to the necessary ash.

There's a wealth of flavor—a store of goodness in honey—that's what makes it different from other sugars and sweets. Honey retains all the natural flavors—it speaks for itself.

To help the busy mother plan the many meals school children require or lend variety to the menus the school lunch room supervisor must prepare, the Institute suggests the following specialities made with or containing honey.

BREAKFAST.

Honied Orange Slices
Hot Cereal Buttered Honey Nut Toast Milk

LUNCH (Carried).

Carrot, Celery and Egg Salad in Glass Jar
Brown Bread Buttered Apple
Honey Date Cake Cocoa

LUNCH (At Home).

Creamed Chipped Beef with Peas on Toast
Buttered Beets Milk
Whole Wheat Bread Oatmeal Cookies

LUNCH (School Cafeteria).

Cream of Tomato Soup—Saltines
Lettuce Salad Apple Sauce
Corn Flake Muffins with Honey
Cocoa

AFTERNOON LUNCHES.

Children are hungry when they come home from school and their energy stores are depleted. Provide them with quick lunches made the honey way and watch how happily they will devour their food.

Carrot Pineapple Sandwich—Milk
Honey Pecan Toast—Cocoa
Graham Honey Cream Crackers—Milk

DINNER.

Stuffed Potato
(Baked Potato, potato removed from shell after baking, mixed with butter, mashed cooked carrot added and returned to shell, reheated)
Spinach Celery Graham Date Gems
Honey Baked Apples

RECIPES.

Breakfast Cereals with Honey.

Every growing child should be given a hot cereal for breakfast. Warm honey drizzled lightly about the hot cereal adds flavor and appetite appeal. Many children who seem not to care for hot cereals enjoy them when served with honey. Let the children drizzle the honey themselves—they will be delighted to have little pitchers filled with honey all for their own. If the honey is slightly warmed, it will drizzle tiny threads and the children will not use too much. Just a few seconds and the honey is absorbed by the hot cereals, then add milk or milk and cream. From one to two tablespoons of warmed honey are ample for the usual amount of cereal to a child's serving.

Breakfast Fruits with Honey.

GRAPEFRUIT.

Peel the grapefruit, divide sections and for each grapefruit of sections or slices, allow 3 to 4 tablespoons slightly warmed honey. Let stand 15 to 30 minutes before serving. May be prepared the night before.

APPLE SAUCE.

Wash cooking apples, quarter and core. Cook with skins on in just enough water to keep from burning. When soft, mash with potato masher and run through strainer. Sauce should be thick like puree. Thin down with slightly warmed honey until sweet enough to satisfy your taste. The Institute prefers from 2 to 3 tablespoons of warm honey to each cup of apple puree. Never peel apples before cooking because much of the flavor and valuable mineral content is lost in so doing.

STEWED APRICOTS.

Wash dried apricots thoroughly and then soak for several hours. Let cook in water in which they were soaked, bringing them to boiling point and then let them simmer slowly until thoroughly done. The amount of water used depends entirely upon the amount of juice preferred. For every cup of apricots, add 4 tablespoons warm honey.

HONIED ORANGE SLICES.

Peel oranges, chill for ½ hour, cut in slices crosswise and remove center core. Allow six slices for each serving. Dip each slice in warm honey and

arrange on small platter for serving. These slices after being dipped in warm honey may be turned over in rice krispies, puffed wheat, puffed rice, corn flakes or other cereal to make an unusual breakfast service.

Sandwich Spreads.

CARROT PINEAPPLE FILLING.

¼ cup shredded pineapple (drained)
¼ cup mild warm honey
½ cup grated carrot
¼ teaspoon salt
¼ cup chopped salted pecans

Mix pineapple, carrots, nuts, salt and honey. Spread on whole wheat bread.

HONEY ALMOND PASTE.

½ cup finely chopped salted almonds
¼ cup warm mild honey

Blend honey and chopped salted almonds. Very good spread on hot toast.

PEANUT HONEY SPREAD.

½ cup honey
½ cup peanut butter

Blend peanut butter and honey, more honey may be added if a sweeter taste is desired. Excellent on hot buttered toast.

GRAHAM HONEY CREAM CRACKERS.

1 cake cream cheese or
1 cup cottage cheese
2 tablespoons warm honey

Blend the cheese and honey until a good spreading consistency is obtained. Spread on crisp graham cracker, top with another graham cracker and cut diagonally.

Vegetables and Dressings.

BUTTERED BEETS.

1¼ cups diced beets (cooked—about ½ inch dices) and ¾ cup beet juice. Let come to a boil.
1½ tablespoons lemon juice mixed with ¾ teaspoons corn starch. Stir in beets. Add 1 teaspoon salt and good teaspoon butter. Remove from fire and stir in 2 tablespoons honey.

LETTUCE SALAD.

Arrange lettuce on salad plate and cover with following dressing.

HONEY DRESSING.

½ cup honey
¼ cup lemon juice
¼ teaspoon salt
3 tablespoons grated pineapple

Stir honey and lemon juice together, add salt and grated pineapple.

Muffins and Bread.

GRAHAM DATE GEMS.

1½ cups white flour
1 cup graham flour
2 tablespoons shortening
16 dates (stoned)
3 tablespoons honey
4 teaspoons baking powder
1 egg
1 cup milk
½ teaspoon salt

Mix melted shortening with honey, add to one egg beaten slightly, then add milk. (If sour milk is used, use ¼ teaspoon soda and 3 teaspoons bak-

ing powder). Stir in dry ingredients which have been thoroughly mixed. Half fill well-greased muffin tins with this mixture and press a stoned date in center of each muffin. Bake in moderate oven (350 ° F.) 20 minutes. Serve hot with honey.

HONEY NUT BREAD.

1½ cups graham flour	1 egg
1½ cups white flour	1 cup honey
1 cup raisins	1 tablespoon shortening
1 cup walnut meats	1 teaspoon salt
1 teaspoon soda	1 cup buttermilk

Sift the two flours. To well-beaten egg, add the honey and shortening which has first been slightly warmed and blended. Add the salt, then all the buttermilk except enough in which to dissolve the soda. Stir in the sifted flour, raisins, and chopped nut meats. Then add the dissolved soda. Bake in slow oven for one hour. Enough for two medium sized loaves.

HONEY SPONGE CAKE.

½ cup honey	½ cup sugar
4 eggs	1 cup flour

Mix the sugar and honey and boil until the syrup will spin a thread when dropped from the spoon. Pour the syrup over the yolks of the eggs which have been beaten until lemon color. Beat this mixture until cold; then add the flour which has been sifted at least three times. Fold the stiffly whipped egg whites into this mixture. Bake for 50 to 60 minutes in floured pan in a slow oven about 325 degrees F. This cake has better flavor after third or fourth day.

Write the Institute for further honey recipes.

HONEY HELPINGS—FOR THE HOLIDAYS.

American Honey Institute, Vol. 1, No. 5, 1929.

The holiday season is with us again and Christmas, the one celebration we anticipate more than any other as a festival of human friendliness, always brings great joy at this time of the year.

Happiness and simplicity were the keynotes of old-time celebrations—the mischievous mistletoe, the vivid-colored holly, the pine and fir trees all are referred to in old-world legends. They are older than Christmas itself. Because the ancient practices represented mirth, jollity, and happy activity children welcomed their return. The Christmas festival really belongs to the children and they should be allowed to take a very active part in all the delightful holiday preparations. Watch them revel in planning little surprises and joyously bustling around as Christmas comes nearer.

The mother who begins now to plan the family holiday packages will have a great advantage when she starts to packing boxes, baskets, and gifts for the yuletide season. Honey goods can be made in advance and are improved by keeping. In fact the Institute is recommending that honey fruit cakes be made at least three months in advance of the time of use, and certain honey fillings be aged two weeks before coating with chocolate.

Without a generous supply of home-made candies, Christmas is indeed incomplete. The candies that taste the best are the kind that satisfy the best, the honey kind that mother and sister make. The *flavor of honey in candy plays a very important part in intensifying that candy taste we all like.* Honey candies make thoughtful gifts.

Fill your holiday gift boxes and baskets with different and delicious goodies this year, with honey nut date bars all wrapped in many colors of Cellophane paper, with honey fruit cake decorated with honey fruit strips and honied nuts, with small attractive bars of honey candy, with jars of honey festively tied, with honey candies daintily formed of many inviting colors, honey cookies of all shapes and sizes, with most tempting relishes and preserves all made the honey way, and with krisp, crunchy flavory honey popcorn balls.

Your candies whether fudge, chocolates or nougats make a favorable impression upon the palate through the sheer deliciousness of that piece of goods and this deliciousness comes through the proper blending of materials. In candies particularly does honey blend most perfectly to produce fine flavors. The simplest of all candies when made with honey are out of the ordinary. The Institute offers you the following honey suggestions for the holidays.

Honey Fudge.

Fudge of standard quality should be of a very smooth texture, not in the least granular and soft enough to cut into even pieces without breaking. The pieces should be from one-half to three-fourth of an inch thick. The use of HONEY is advisable because it gives the fudge a smoother texture and will aid in keeping it moist. The temperature at which fudge is beaten is a very important factor. Larger sugar crystals will form and the fudge become grainy if stirred while hot. Always allow to cool—then the crystals will be small and the fudge creamy.

NUMBER I.

2 cups sugar
1 square chocolate (cut fine)
¼ teaspoon salt
Butter size of walnut
1 cup evaporated milk.
¼ cup honey
1 cup nuts

Boil sugar, chocolate, salt and milk 5 minutes. Add honey and cook to the soft ball stage (235° F.) Add butter. Cool. Beat until creamy. Add nuts pour on buttered pan and when hard cut in squares.

NUMBER II.

2¼ cups sugar
1½ squares chocolate (fine cut)
½ cup honey
1 cup cream or rich milk
1 cup nut meats

Cook until it forms a firm ball when tried in cold water. Take from fire, and beat until creamy and ready to harden. Add nuts, pour on buttered plate, mark in squares.

Honey Divinity.

2 cups sugar
1/3 cup honey
Pinch of salt
1/3 cup water
2 egg whites

Boil together the sugar, honey and water until the syrup spins a thread when dropped from a spoon (about 250° F.) Pour the syrup over the well-beaten whites of the eggs, beating continuously and until the mixture crystallizes. Drop in small pieces on waxed paper.

Honey Taffy.

2 cups honey
2 cups sugar
⅔ cup cold water
pinch of salt

Boil the water, honey and sugar together to 288° F. (a hard ball in cold water.) Add salt. Put on buttered dish to cool, then pull until white. If the pan in which the candy is cooked is buttered around the top, it will not boil over.

Honey Pecan Pralines.

¾ cup evaporated milk
1 tablespoon butter
1½ cups salted pecans
½ cup honey
1 cup maple sugar
1 cup brown sugar

Mix sugars, evaporated milk and salt together. Cook slowly for about five minutes. Then add honey. Cook until firm ball is formed when dropped in cold water. Remove from fire, add butter and beat vigorously until the candy is soft enough to form flat cakes when dropped from a spoon. Arrange nut meats in groups on oiled paper and drop candy from spoon over nuts. Let the pralines set, then wrap individually.

Honey Nougat.

⅜ cup honey
½ cup brown sugar
1 pound almonds
2 egg whites

Boil the honey and sugar together until drops of the mixture hold their shape when poured in cold water. Add the whites of the eggs well beaten and cook very slowly stirring constantly until the mixture becomes brittle when dropped into water. Add the almonds and cool under a weight. The candy can be broken into pieces or may be cut and wrapped in waxed paper.

Honey Centers for Coating With Chocolate or Fondant.

HONEY BITTERSWEETS.

Let section of comb honey remain in refrigerator about 24 hours before using for coating. Then dip the knife to be used for cutting in boiling water. Cut comb honey into pieces about ¾ of an inch long and ⅜ inch wide. Place pieces on trays covered with waxed paper and chill for thirty minutes before coating. Be sure dipping chocolate is of proper temperature and then coat candy pieces just as in coating cream centers. Drop a walnut, pecan, or almond on each piece.

It requires a little practice to be able to turn out honeyed bittersweets that do not develop many honey leaks but you will find that one or two of these unusual chocolates packed in your candy boxes will indeed delight the receiver.

HONIED ORANGE STRIPS.

Cut rind of three oranges in strips (should be about 1½ cups of strips of rind.) Boil in salt water (about 1 teaspoon salt to cup water) until soft—about one half an hour. Drain, rinse in cold water and let simmer very slowly in 1 cup of honey for about 45 minutes.

Lay each strip on waxed paper and let stand for day or two before coating with dipping chocolate. Those fruit strips when coated look like green beans in shape except of course they are brown in color. When one bites into them, he is delighted with the flavory jelly like center.

HONIED GRAPEFRUIT STRIPS.

Rind of 2 grapefruits cut in strips about ⅜ of an inch wide and 1½ inches long. Four cups of water and 4 teaspoons salt.

Allow grapefruit to boil in salt water for 30 minutes. Drain and rinse. Add 2 cups of hot water and then let boil again for 6 minutes. Strain and rinse in cold water and drain again.

Mix 2 cups of honey with 1 tablespoon lemon juice and ¼ teaspoon cinnamon, 2 teaspoons vinegar. Pour over grapefruit strips and let simmer for about an hour. Let grapefruit stand in honey syrup over night and then carefully pick out strips, lay on waxed paper and after 12 to 24 hours of drying, coat them with medium bitter or milk dipping chocolate.

HONEY MILK PASTE.

½ cup dry skim milk
½ cup warm honey
1 tablespoon butter

Mix warm honey and butter and blend with dry skim milk. Allow this paste to age at least one week before using.

There is no end to the many fine honey cream center combinations that can be made from this basic paste. No flavor is lost by using this formula for there is no cooking of the honey. The honey and dry skim milk are blended without being heated. The secret of the flavor of this candy is in the proper aging.

Here are a few of the variety of centers that may be developed from this basic and highly nutritious center.

Wrap the honey milk paste around cherries and coat with dipping chocolate. This makes a delicious *Honey Cherry Cream Center.*

Mix shredded cocoanut with this honey milk paste. Roll into little balls and coat with dipping chocolate. A fine *honey cocoanut cream centered* chocolate results.

Blend chopped dates with the honey milk paste, shape and coat with dipping chocolate. Then you have a honey date cream chocolate.

Blend chopped pineapple pieces with chopped nuts, add to the honey milk paste, shape and coat with dipping chocolate.

Chopped crystallized ginger may be added to the paste, this mixture made into little balls and coated with dipping chocolate.

HONEY POPCORN BALLS.

Without honey popcorn balls, the holiday confection assortment would not be complete so far as the children are concerned.

Honey can be heated up to about 245 degrees F. without being greatly changed in color or flavor. If it is heated carefully most of the water is expelled. The honey then becomes hard on cooling and can be used for making popcorn balls. Dip the popped corn into the hot honey, shape into balls and cool. Wrap them in waxed paper or colored Cellophane papers.

WRITE THE INSTITUTE FOR FURTHER RECIPES!

There are many honey cookies for the holidays—perhaps the most popular one that is always a part of the European holiday preparation—*Nuremberg Lebkuchen.* Basel Honey Cakes called in the original Swiss—Baseler Leckerli, Honey Whole Wheat Animal Cookies, Pffeffernusse, ginger cookies, honey nut date bars and others.

Cranberry sauce, honey mousses, honey pumpkin pie, honied sweet potatoes—and many other dishes always served at Christmas time are deliciously different when made the honey way.

Write the Institute for any additional holiday recipes you may wish.

HONEY HELPINGS—FOR BREAKFAST.

American Honey Institute, Vol. I, No. 6, 1930.

In every home everywhere bright fires are kindled and replenished in the early morning. Our houses must be warm and comfortable all through the cold winter months. Our bodies must be fed just as carefully as our fires for unless we keep them at just the right temperature with the right kind of food they suffer. When our bodies are not well we do poor work and our children play listlessly and make little progress in the school room.

So the first and most important meal of the day is a good breakfast and in the cold winter months that meal must be rich in calories, full of abundant stores of heat and energy. The sugars and starches are splendid fuel foods and ample helpings of breakfast foods drizzled with honey, stacks of hot griddle cakes served with honey, crisp hot waffles topped with a honey butter sauce—all are good protection against winter cold. No finer beginning can be made to a busy day than a heaping plate of honey muffins served piping hot with comb honey. Honey is high in energy value and its sugars serve as fuel for muscle activity.

Here are a few menus with recipes for your breakfast—a meal considered by many as the most important of all.

Menu Suggestions.

Honied Grapefruit
All Bran Waffles Honey Sauce
Crisp Bacon Coffee Tea

Cranberry Sauce Sweetened with Honey
Pecan Waffles Honey
Coffee Milk Tea

Orange Slices Corn Flake Muffins
Poached Eggs Comb Honey
Coffee Tea Milk

Prune Sauce
Hot Cereal Honey Oatmeal Gems
Coffee or Hot Chocolate

Honey Drizzled Fruits Cracked Wheat
Cherry Muffins Honey
Coffee Tea Milk

Honey Cream Waffles with Little Pork Sausages
Baked Apples Coffee Tea Milk

Fried Cornmeal Mush
Honey
Stewed Apricots Bacon
Coffee Tea Milk

Breakfast Fruits with Honey.

Most of our breakfast fruits are sweetened before being served—some of us prefer sweetening them at the taable. Such fruits when honey drizzled are delightful, their flavor has a new tang and the whole dish has added appetite appeal. Drizzle honey about your grapefruit over the orange slices, on fresh pineapple, sweeten baked apples with honey, stewed fruits and all sauces.

Cereals with Honey.

Have you ever noticed on a cold morning how a dish of good hot cereal stimulates and brings about a feeling of well being? Hot cereals honey drizzled carry heat to the body. Honey permeates the cereal and carries with every drop new flavor. Just drizzle warm honey lightly about the hot cereal. Add milk and cream as usual.

Vitality Cocktail.

Yolk of 1 egg Juice of ½ a lemon
Juice of 1 or 2 oranges 2 teaspoonsful of honey
Beat these ingredients together and drink every morning.

Honey Cream Waffles.

Waffles and honey have always been associated but one usually thinks of this association as serving honey over the waffle and not baking it in the batter. When the pour batter contains honey, a more crisp and yet tender

waffle is obtained. Most everyone likes a good crisp waffle, but a variation from the ordinary waffle is more than enjoyable. By using the regulation honey batter and adding nuts or dried fruits, one may obtain a truly delicious result. For your unexpected visitor try a Honey Pecan or Honey Date Waffle.

Basic Recipe for Honey Cream Waffles.

1 egg beaten very lightly
4 teaspoons baking powder
1 teaspoon salt
2 cups milk
2 cups flour
¼ cup margarine (melted)
3 tablespoons honey

Mix shortening, honey, salt with beaten egg. Sift baking powder and flour together. Stir in alternately with flour and milk until full amount has been added.

Honey Pecan Waffles.

Pour Regulation Honey Cream Waffle batter on waffle iron, sprinkle from 8 to 10 salted pecans over waffle before top lid is let down. Press down top lid and bake until golden brown. Serve piping hot with warmed honey or comb honey. Honey Pecan Waffles are delicious when made about half regular size, a la moded with ice cream and topped with honey fudge sauce.

Honey All Bran Waffles.

The same as above only use one-half cup of all bran flakes for each waffle, sprinkle all bran over waffle before top lid is let down.

Honey Date Waffles.

Three chopped dates and 1 teaspoonful chopped nuts to each waffle, sprinkle over waffle before top lid is let down.

Plain extracted honey may be served as a sauce for waffles and is better if it has been slightly heated before serving. If this is found to be a little too sweet, a very pleasing sauce is secured by combining honey with medium hot water and butter, 1 cup warm honey, ½ cup warm water and 1 teaspoon butter.

Plain Honey Sauce.

Place two parts of honey and one part of butter in a bowl, and cream and beat the mixture until very smooth.

Spiced Honey Sauce.

Place plain honey sauce in a bowl, and add finely ground cinnamon to taste, blending the ingredients well.

Honey Orange Sauce.

Honey fruit sauces served with waffles are a great success. Cream one-third cupful butter and ½ cupful honey. Add 1 cupful confectioner's sugar, beating constantly; then add ¼ cupful chopped honeyed orange strips and 2 teaspoons lemon juice.

Honey Pineapple Sauce.

Cream 1/3 cupful butter with 1 cupful warm mild honey. When well mixed add 2 cupfuls drained shredded pineapple.

Honey Muffins.

Of all the foods for breakfast, nothing is more appetizing and satisfying than delicious honey muffins, crisp and brown, broken apart and spread with comb honey.

Honey Oatmeal Gems.

1 egg
¾ cup milk
1 cup oatmeal
2 tablespoons margarine
1½ cups flour
1 teaspoon salt
¼ cup honey
¼ cup chopped walnuts
4 teaspoons baking powder

Beat egg lightly, melt the margarine and blend with honey. Add this mixture to beaten egg. Mix together the flour, oatmeal, baking powder, salt and nut meats. Alternately add milk and flour to egg and honey mixture until all milk and flour have been added. Bake in well-greased muffin tins for thirty minutes in hot oven (400-450 ° F.) Will make 15 muffins.

Basic Muffin Batter.

1 egg, beaten very lightly
1 teaspoon salt
4 teaspoons baking powder
2 teaspoons margarine
2 cups milk
2 tablespoons honey
2 cups flour

Mix margarine and honey with beaten egg. Alternately add milk and sifted dry ingredients. Beat until mixture is smooth and creamy. Pour in well-greased muffin tins and bake in hot oven (425 ° F.) for thirty minutes. Serve hot with comb honey. Will make 24 muffins.

Honey Cherry Muffins.

Use Basic Muffin batter and drop four cherries in each muffin (after batter is poured in well-greased muffin tins).

Honey Cheese Muffins.

After batter is poured in well-greased muffin tins, sprinkle one teaspoon grated cheese over each muffin.

Honey Toasts.

Honey Toasts are delicious. Any of the following will help you to vary your breakfast menu.

PLAIN HONEY TOAST.

Trim slices of bread (slices should be about ⅜ inch thick). Toast properly then butter and spread with comb honey.

HONEY NUT TOAST.

Same as for honey toast, only sprinkle a teaspoonful chopped walnuts over each slice of toast that has been spread with comb honey.

HONEY CINNAMON TOAST.

Spread slices of fresh toast with butter, brush with honey (about 1 tablespoonful honey for each slice), sprinkle with cinnamon, and oven toast enough to blend cinnamon and honey.

HONEY PECAN TOAST.

Spread slices of fresh toast with butter, then with a paste made of comb honey and salted pecans. (About 2 tablespoonsful whole salted pecans and

2 tablespoonsful comb honey). Press together one slice of plain buttered toast with 1 slice honey pecan toast. Reheat enough for both sides to absorb honey, and serve piping hot.

HONEY NUT BREAD TOAST.

Place thin slices of honey nut brown bread (recipe for brown bread given in Honey Helpings No. 4) on thin pan, oven-toast both sides, spread with butter and honey. Cut in triangles and serve open face.

HONEY ORANGE NUT BREAD TOAST.

Make the same as honey nut bread toast. Both of these breads must be oven-toasted and very carefully turned over on flat tin with spatula so that the slices will remain intact. Hot honey nut bread toast is delicious when spread with orange marmalade immediately when removed from oven.

Any of the above toasts are best when served piping hot.

NOTE.—It is suggested that our members wishing copies of Honey Helpings for distribution to customers write for price list of same. Send requests to The American Honey Institute, Chamber of Commerce Building, Indianapolis, Indiana.

REPORT OF 1929 ANNUAL TOUR.

(V. G. Milum, Champaign.*)

According to the program as given in the monthly bulletin for July, the third annual tour of the Illinois State Beekeepers' Association and the Division of Apiary Inspection, State Department of Agriculture, was held on July 24 to 26, starting at Paris, Illinois and ending at Mt. Vernon in Jefferson County. Thirteen counties were traversed in the course of the tour, while apiaries were visited and meetings held in all but one of these counties which were as follows: Clark, Crawford, Wabash, White, Gallatin, Saline, Williamson, Jackson, Perry, Franklin, and Jefferson.

A total of one hundred and fifty beekeepers registered at the various points along the way during the three days of meetings, as compared to the total registration of one hundred and sixty-five during the four days of the 1928 tour. A total of four cars and nine persons made the entire trip this year, as compared to a total of sixteen persons in 1928. Those who have the entire trips of 1928 and 1929 to their credit are: S. A. Tyler, San Jose; J. W. McKenrick, Silvis, and H. G. Frymier, Carbon Cliff—both of Rock Island County; and V. G. Milum of the University of Illinois. Others making the entire 1929 trip were Mr. A. L. Kildow, State Apiary Inspector, and Mrs. Kildow; Frank C. Pellett, Atlantic, Iowa, Associate Editor of the American Bee Journal; John Tyler, San Jose; and John S. Dowdy, Atlanta, Illinois.

Mr. Kildow and Mr. Pellett, assisted by V. G. Milum, gave various discussions at many of the stopping places and at the evening meetings held at Eldorado and Mt. Vernon. An interesting feature of the tour were the discussions given by the owners of the various apiaries visited. This feature was of great interest to the beekeepers who covered the entire tour, for they soon learned to know what the regular speakers were going to talk about after the first day.

The first day's attendance was an enthusiastic crowd who seemed to be principally interested in the question of queen raising, as indicated by their attention at the queen rearing yards of Herman McConnell at Robinson, Illinois, and our friend Jay Smith of Vincennes, Indiana. The first stop was at the apiary of Maxel Mapes, Paris, Ill. Mr. Charles Kruse of Paris held the attention of the visiting beekeepers when he told them of his enthusiasm for the business of beekeeping, and the details of preventing swarming in comb-honey production. On the question of marketing, he stressed the importance of establishing rigid grades for comb honey, and carefully grading every section of honey—thus assuring the consumer or buyer that the sections in the back row

* Reprinted from August, 1929, Association Bulletin.

of the bottom case of a pile was exactly like every other section in the pile, and those exhibited behind the glass fronts of the cases. He advised that any stained or otherwise undesirable sections should be disposed of in some other way than to the consumer.

Mr. McConnell at Robinson discussed the subject of queen rearing, demonstrating his methods of producing queens, which are quite similar to the ordinary methods practiced by queen breeders. His cell-building colonies consist of three-frame nuclei separated from a strong colony on either side by a sheet of queen excluding zinc, thus assuring protection for the queen cells and an abundance of food from the nurse bees of the two colonies.

About forty beekeepers assembled at the apiary of Jay Smith at Vincennes, Indiana to take advantage of the generous offer of Mr. and Mrs. Smith to serve a noon-day lunch, and from all reports, everybody was perfectly satisfied. After the lunch hour, Mr. Smith discussed his

Beekeepers on the tour at the home of Raymond Hale at Cottonwood.

system of producing queens, covering various other related beekeeping subjects before he led his listeners to the apiary to observe a queen bee, which he claimed was five times as big as any queen honey bee they had ever seen. The queen was definitely located in one of the queen mating nuclei, but her followers rather forcibly resented the intrusion of the curious visitors. She happened to be a bumble-bee.

Most of the beekeepers who attended the first day of the tour failed to show up on the morning of the second day, but the meetings at the various stops were quite well attended by local beckeepers. Among the places visited were the apiaries of Robert Watt at Mt. Carmel, William Newcomb of Carmi, R. H. Hale of Cottonwood, James Wade of Ridgway, and Ora Funkhouser of Eldorado. Mr. Hale is an extensive orchardist and maintains a large number of colonies for the purpose of pollinating the fruit blooms. He experienced some loss with his bees this

year from the effects of spray poisoning, which problem seems to be a more serious one in cold, wet springs. We hope to have more to say on this subject in a later issue of the bulletin. An additional stop, not scheduled, was made at the apiary of H. W. Wilson, located on the Billman farm between Ridgway and Eldorado. On the way to Eldorado the caravan was stopped near a cornfield to investigate the growth of a vine known as climbing milk-weed or blue-vine, which the beekeepers of that territory say often produces a considerable surplus in the fall. The honey is described as of excellent flavor and seldom granulates. The plants were just coming into bloom at the time of our visit.

The chief point of attraction at the evening meeting at Eldorado seemed to be the bee smoker contest, in which H. W. Wilson of Eldorado won first over J. L. Barton of the same place. Two other contestants failed to maintain a smoke in their smoker for the required half hour. The contestants were allowed to use their own fuel, each being supplied

Home and apiary of Roy Annear, Mulkeytown.

with three matches and a period of two minutes time for lighting of the smokers, after which the smokers were allowed to stand unmolested for one-half hour. At the end of this time the owners of the smokers were allowed to give them three puffs, but a thousand puffs would not have had any effect on two of the smokers. Prizes of ten frames and foundation and two pounds of foundation were given for first and second, respectively, these being generously donated by certain of the bee supply manufacturers.

Beekeepers assembled at the apiary of Louie Vannis at Harrisburg on the morning of Friday, July 26, but the chief interest seemed to be in the delicious peaches ripening on the trees, which furnished shade for Mr. Vannis' bees. From this point, the caravan journeyed westward toward Marion, making a short stop at the refreshment stand on the site of the famous Charlie Birger resort. The proprietor related the history

of the place, and an inspection was made of the various points of interest, but some of those present acted as if they expected a ghost to appear from some unknown corner.

At the apiary of Otis Kelley near Marion, a short meeting was held between 10:00 and 11:00 a. m., and then the increasing crowd journeyed on to the apiary of Charles Valerius at Elkville, where the owner gave an interesting discussion on the methods practiced. His bees were housed in double rows covered by a shed, and made an interesting and rather different appearance from most of those visited. After lunch, at Duquoin, the beekeepers assembled at the apiary of Robert Zelder and then proceeded to the home of Roy Annear of Mulkeytown, where a short meeting was held. Mr. E. S. Silkwood of Christopher seemed to be the principal attraction at this point, where he demonstrated his method of applying a cure for rheumatism. The cure consisted of inserting the bee-stings of twenty-five or thirty bees in the region of his

Apiary of Roy Baxley, Christopher, Illinois, only 18 months a beekeeper. He has started right.

knees (not bees' knees) and allowing the stingers to spend themselves. Mr. Silkwood stated that months ago he was unable to walk but now he appeared to be getting along quite well, although he was hoping for further relief. Lemonade and ice cream served by Mr. and Mrs. Annear seemed to revive the spirits of the crowd who journeyed on to the apiary of Roy Baxley at Christopher, which was probably the point of largest attendance. Mr. Baxley has only been keeping bees for a year and a half, but he certainly had his bees in good condition, and was trying out a number of ideas regarding management and methods of production. He had divided some of his colonies earlier in the season, and was expecting to unite them again at the beginning of the fall flow from heartsease and Spanish needle. This method is practiced with good results by beekeepers living in areas not having a late spring or summer honey flow. It is sometimes possible to bring each divided portion up to the

fall honey flow with the same or equal strength of the undivided colony, thus securing an increased crop if the two portions are again united at the beginning of the honey flow. Similar experiments have been conducted by the writer at the University of Illinois, which will be reported upon in a later issue.

Following the meeting at Christopher, the beekeepers were led to the apiary of Mr. Meredith at Whittington, and then on to the city of Mt. Vernon, where the evening meeting was scheduled. There was a rather poor attendance at this last meeting, but those present had a number of questions to ask the speakers. There being no entries in the bee smoker contest, the prizes were turned over to Mr. C. F. Anderson, teacher of vocational agriculture at Mt. Vernon for use in his bee club work. Mr. Anderson expects to feature bees and honey in the annual exhibit of the boys' and girls' work at the State Fair in August.

Those in charge of the annual tour wish to take this opportunity of thanking everyone connected with the tour for their kindness and cooperation in making the tour a success. We should have mentioned also that Mr. Demuth of the A. I. Root Company and Mr. M. G. Dadant of the American Bee Journal and Dadant & Sons were unable to attend, which fact many of the beekeepers seemed to regret, as evidenced by their queries.

May the next annual beekeepers' tour be bigger and better.

COUNTY ASSOCIATION ACTIVITIES FOR 1929.

Champaign County Association (10).*

This association held no meetings in 1929 but plans are being made for reorganization in 1930. Association dues are being collected by W. H. Force, 1714 West Church Street, Champaign and V. G. Milum, Vivarium Building, Champaign.

Christian County Association (0).

No meetings were held in 1929 and efforts to revive the association have not been successful.

Cook–DuPage County Association (84).

(A. D. Boal, Downers Grove, Secretary.)

Officers.	1929.	1930.
President	R. M. Warren	A. D. Boal
First Vice-President	H. S. Heise	Wm. Bigel
Second Vice-President	Mrs. Eleanor Simmer	Ed. Groh
Third Vice-President	Earl Woolbridge	Adam Bodenschatz
Fourth Vice-President	E. J. McCormick	C. L. Duax
Fifth Vice-President	Wm. Bigel	Miss Anna Krier
Secretary-Treasurer	A. D. Boal	E. J. McCormick

(Note: The address of the 1930 Secretary is Mr. E. J. McCormick, 6810 South Winchester Avenue, Chicago, Illinois.)

The first meeting of 1929 was held at the Bismark Hotel, Chicago on the evening of February 20. There were about a hundred present and the audience listened to three splendid talks by Dr. Barnard, Miss Malitta Fischer and F. B. Paddock. This meeting was included in our annual report for 1928.

The annual meeting and election of officers was held at the Bismark on March 25 with about fifty present. The speaker was Mr. G. H. Cale of the American Bee Journal.

Meetings were held during the summer at the apiaries of A. D. Boal, J. Frank Haan and Wm. G. Howard. The first at Downers Grove with about 100 present consisted of demonstrations of inspection and hive manipulation by inspectors Wooldridge and Duax followed by talks by Mr. H. H. Root of Medina, Ohio and State Inspector A. L. Kildow. This latter part of the program was adjourned to the lawn of another Downers Grove member Mrs. Walter C. Lyman. After the program

* The number in parentheses ( ) following the name of the association indicates the number affiliated with the Illinois State Beekeepers' Association during the period between Annual Conventions, December 6, 1928 to December 3, 1929. Members at large from particular counties are not included. A Secretary's name appearing under the name of the Association indicates a separate annual report furnished by that Secretary.

refreshments were served and departing guests were presented with large bouquets of peonies from the Lyman grounds.

The second meeting at Mr. Haan's home in DesPlaines was attended by about sixty and splendid talks were given by Prof. V. G. Milum, State Apiculturist and by Mr. Haan.

A third meeting was held on September 7th, at the Howard home in Palos Park and was attended by about fifty. Mr. J. M. Barr of West Allis, Wisconsin was the speaker. At this meeting it was voted to attempt the formation of a larger association and if this failed to prove practical to change the present association name to Cook-DuPage Beekeepers' Association.

Another meeting of Cook County and members from neighboring counties was held on November 20th, and the possibility of forming the new association was discussed and a temporary organization affected. As it later proved impossible to arouse enough interest the matter was dropped. Professor Milum and Mr. C. D. Adams of Wisconsin were speakers at this meeting.

The 1930 annual meeting of The Cook-DuPage Beekeepers' Association was held on February 6th at the Bismark Hotel and officers were elected as listed above. The business meeting was followed by an illustrated lecture by Prof. R. H. Kelty, State Apiculturist of Michigan. Other visitors were W. A. Weir, Secretary-Treasurer of the Ontario Honey Producers' Co-operative and Herbert Link of LaPorte, Indiana.

At a Cook-DuPage summer meeting. From left to right, V. G. Milum, Champaign; J. R. Wooldridge and C. L. Duax, Chicago; A. D. Boal, Downers Grove.

DeKalb County Association (26).

(C. H. Tudor, DeKalb, Secretary.)

This association held a field meet and picnic at the home of Ross Morrill of Batavia, Kane County on August 25. As a result 12 new members were added to the association, two of them being former members of the Kane County Association.

Our association held its annual meeting December 14th, electing for officers, Mr. Roy Thompson of Sycamore as President, Mr. Ross Morrill of Batavia as Vice-President, and C. H. Tudor of DeKalb as Secretary-Treasurer. Old officers for 1929 were Mr. Chris Holm, Genoa, President; Mr. Wm. Harris, Malta, Vice-President and C. H. Tudor, Secretary-Treasurer.

Our Association was not in favor of joining the North Eastern Illinois Beekeepers' Association. Two or three thought that it might be O. K. DeKalb County Association members are very much in favor of a tax or license being paid in order to keep bees. They suggested about $5.00 per stand for from one to three stands and a very small amount per stand for all over that amount. They think that this would help to keep down disease as the ones keeping a few and never taking care of them would do one of two things, quit or take care of them. They also thought that it would put a better grade of honey on the market. If The Illinois State Beekeepers' Association and the State could get together on this we feel sure that it would help all concerned. Our association is to hold two field meetings this year with the usual "Pot-luck" dinner and ice cream. Everybody welcome, so when it comes off don't miss anything.

Edgar-Vermilion County Association (0).

Although this association held an organization meeting at Vermilion Grove on September 13, 1928, and another meeting at the Farm Bureau Office at Danville on March 16, 1929, no members have ever been affiliated with the State Association.

Franklin County Association (0).

A meeting of the beekeepers of this county was called for the evening of March 29, 1929, at Benton, but owing to poor weather only a small number attended. Those present decided to continue under the old arrangement with Mr. E. E. Glick, County Farm Adviser, acting as Secretary. A. L. Kildow and V. G. Milum attended the meeting.

Franklin County was included in the 1929 summer tour with stops at the apiaries of Roy Annear of Mulkey Town, Roy Boxley of Christopher and R. C. Meredith of Whittington.

Up to March 7, 1930, this association has not affiliated any members with the State Association since August 13, 1926.

However, this association was reorganized in 1930 with John Matelic, 2102 E. Main Street, West Frankfort, as Secretary, and several members have been affiliated.

Fulton County Association (12)

No report has been received of any activities of this association for 1929.

Dr. J. E. Aigley of Farmington is Treasurer and J. E. Watts of Canton, the Secretary of the Association.

Grundy County Association (8)

There are no reports of activities of this association for 1929, although affiliation dues were sent in by Ernest H. Davy, formerly of Morris, but now living at Gardner.

Mr. C. J. Anderson, Morris, Inspector in Grundy County has been sending in 1930 dues for some members at large.

Hancock County Association (9)

Apparently this association showed no activity in 1929. Mr. M. G. Dadant of Hamilton serves at "Collector of Revenues" and sent in the affiliation fees.

Henry County Association (39).
(Elmer Kommer, Woodhull, Secretary.)

For a report of the Henry County Beekeepers' Association will say that we held two meetings, one on February 8th, when our Association held a business session at the Court House and sent our wax to be worked into foundation. Various other business was attended to, including the bonding of Secretary and Treasurer.

No field meeting was held this past year as is the usual custom, on account of the Beekeepers Tour which was held in Eastern Illinois. Being unable to secure speakers at that time, we decided to wait until a later date and have a joint meeting with Rock Island County.

On October 3, 1929, the annual meeting was held when the following officers were elected: President, Ed Kommer, Cambridge; Vice-President, H. H. Wilson, Geneseo; Secretary, Elmer Kommer, Woodhull; Treasurer, A. E. Swanson, Hooppole; Directors—A. B. Fessler, Cambridge; P. A. Carlson, Galva; Ed. Peterson, Kewanee.

A talk was made by Axel Peterson, Galva, Illinois, a former President of our County Beekeepers' Association, now Deputy County Treasurer who is one of the beekeepers that is boosting for our Association and "Illinois Honey."

The Henry County Association is also trying to get a third paid ribbon on honey at the County Fair for 1930 exhibitors which will make a larger and better display of honey at the fair.

A joint meeting with the Rock Island County Beekeepers' Association was held on December 7th, where we had as speakers M. J. Deyell, Mgr. of the A. I. Root Co. apiaries, Medina, Ohio; G. H. Gale, Associate Editor of American Bee Journal, Hamilton, Illinois; A. G. Gill, of the A. I. Root Co. Chicago, Illinois; V. G. Milum, Secretary Illinois State Beekeepers' Association, Champaign, Illinois; and C. H. Tudor, Deputy Inspector of Apiaries, DeKalb, Illinois. These gentlemen gave some wonderful talks and a good attendance was had.

Arrangements were made with Radio Station WHBF of Rock Island, Illinois for some short talks on honey and Mr. Deyell and Mr. Gill spoke at the noon hour, while Mr. Cale gave a wonderful talk in the evening.

We believe that efforts should be put forth to have more short radio talks on "honey" which we believe will create a larger demand for "Illinois Honey."

Iroquois County Association (10).

We have no reports of 1929 meetings or other activities.

Mr. L. W. Wise of Watseka is Secretary, J. N. Koritz of Buckley, President and H. L. Dunn of Onarga, Vice-President. These 1929 officers were reelected at the annual meeting on February 11 to again lead the association in 1930.

Jefferson County Association (10).

This association held a meeting at Mt. Vernon on Saturday afternoon, March 30, with A. L. Kildow and V. G. Milum as the speakers.

This county was included in the program of the 1929 tour with a final evening meeting at Mt. Vernon on July 26.

The officers of the association are Xavier Kiefer of Belle Rive, President; Roy Wooden, Mt. Vernon, Vice-President, and C. F. Anderson, Mt. Vernon, Secretary-Treasurer.

The latter was responsible for calling the first 1930 meeting on January 25 at the Mt. Vernon High School with V. G. Milum as the speaker.

Jersey County Association (17).

(C. A. Mackelden, Jerseyville, Secretary.)

The Jersey County Beekeepers Association has been slowly forging to the front, and are now taking a very active interest in the raising of bees and the marketing of honey.

The year 1929 brought about many changes, not only in equipment, but in advertising and marketing honey. Every beekeeper that belonged to the association had sold his honey crop by the first of October. The local newspapers here have also been splendid boosters, and also the grocery stores. We made it a rule to wrap all comb honey in celophane, and put it in individual boxes for them.

With all beekeepers here working in harmony we expect in 1930 to double our output. One of the chain stores has agreed to handle our honey the coming year, which is very unusual.

Jo Daviess County Association (18).

This association held its first meeting for 1929 at the Court House at Galena on January 5.

On Saturday afternoon, October 12, a meeting was held at the apiary of Henry Price of Elizabeth. Many interesting and helpful ideas were obtained by inspection and demonstration by Mr. Price in the apiary, after which V. G. Milum gave a discussion of problems of apiary management. C. D. Handel of Savanna also expressed his ideas on the subject.

The association planned to hold their 1930 field meeting at the apiary of Joseph Gundry of Warren, sometime in September. Their annual meeting was held at Galena on January 18, 1930.

The officers of the association both for 1929 and 1930 are Chris. Duerrstein, President; Chas. Knantz, 1st Vice-president; Henry Amon, 2nd Vice-president; and Edward Jeffrey, Galena, Secretary-Treasurer.

Kane County Association (0).

The only 1929 activity in this county was apparently the meeting at the Ross Morrill apiary at Batavia on August 25, under the auspices of the DeKalb County Association.

McHenry County Association (9).

This association held no meetings in 1929 but it was not the fault of the Secretary, Ray Page of McHenry. Unfortunately a speaker could not be secured because of no other requests from neighboring county associations at a suitable date.

Nineteen hundred and thirty activities are starting with a meeting at Woodstock on March 20, in cooperation with the High School Agricultural Classes.

McLean County Association (10).

This association held its annual meeting and election of officers at the Farm Bureau office at Bloomington on the evening of Friday, April 26. The discussion was led by V. G. Milum after which generous refreshments were served. Mr. Henry Kauffman of Stanford was elected president, Mr. W. E. Crowe of Gibson City, vice-president and William B. Brigham of Bloomington was reelected secretary-treasurer. The association planned to hold a field meeting sometime during the summer at the apiary of the newly elected president.

Mercer County Association (14).

This association held its annual meeting with election of officers on the lawn of H. E. Miller, Aledo, on September 29th. The officers elected are: President, R. M. Greer, Joy, Ill.; Vice-President, H. U. Decker, Aledo, Ill.; Secretary and Treasurer, Will C. Egbert, Aledo, Ill.; Directors, H. E. Miller, C. W. Brown, A. N. West, all of Aledo.

Beekeepers of this county were included in the joint meeting at Rock Island on December 8.

Montgomery County Association (10).

This association held a meeting at the Farm Bureau office on Monday evening, March 11. Notices of other meetings may have escaped our attention.

Mr. Wesley Osborne of Hillsboro is the Secretary of this organization.

Ogle-Lee County Association (12).
(Elizabeth Ordung, Oregon, Secretary.)

The Ogle-Lee County Beekeeper's Association held its annual meeting at the Polo Theatre, on September 18th, 1929. Interesting and instructive pictures on bees were shown. All enjoyed the talks and discussions in which C. H. Tudor of DeKalb, S. S. Claussen of Oregon, G. L. Sauer of Polo, and Robert Donovan of Peru were the speakers.

The officers of the previous years who were reelected are: President, George L. Sauer, Polo; 1st Vice-President, Charles Mon, Polo; 2nd Vice-President, Edgar Confer, Lindenwood; 3rd Vice-President, E. H. Stanley, Dixon; Secretary-Treasurer, Elizabeth Ordung, Oregon.

Peoria County Association (2).

No activity reported for 1929.

This association was reorganized in 1930 with Myron B. Shoff of Peoria as President; Ed. Lehman, Peoria, Treasurer, and Mrs. Mary F. Johnson, 418 S. Adams St., Peoria, as Secretary.

Piatt County Association (18).

This association held its annual meeting and election of officers on Friday, February 2. After a lantern slide lecture by V. G. Milum covering various phases of beekeeping and remarks on marketing, the meeting was thrown open for general discussion. The election of officers resulted in the choice of Mr. C. W. Brown of Monticello, for President, and Scott Piatt of Monticello, as Vice-President, with Emory Warner of Monticello, being reelected Secretary-Treasurer.

The 1930 annual meeting was held at Monticello on Monday, January 20, starting at 10:00 o'clock. Mr. A. G. Gill of the A. I. Root Company of Chicago attended the meeting and discussed ways of improving beekeeping conditions. He pointed out that only a small percentage of the rank and file of beekeepers ever obtained much information in the form of bee journals and attendance at meetings. Among other things, Mr. Gill suggested that individual beekeepers should attempt to better their own standards by reading at least one new bee book a year and by studying some particular problem or phase of beekeeping either alone or cooperatively with some other individual or group of beekeepers.

At this meeting, a new wrinkle was injected, that of serving free lunch at noon, which in this case was a regular meal at a restaurant near the Court House. Following the noon hour, V. G. Milum of the University of Illinois gave a lantern slide discussion of the results of recent wintering experiments as well as some suggestions regarding spring manipulations. The annual election of officers resulted in the choice of Scott Piatt of Monticello as President, succeeding C. W. Brown who was elected Vice-President. Mr. Emory Warner, the local inspector was retained as Secretary-Treasurer for 1930. The association is planning on a summer meeting and on taking away the laurels of some of

the larger associations in spite of the fact that they ranked fifth in membership in 1929. Each member present was urged to obtain two new members during the year.

Rock Island County Association (29).

This association met at the Lawrence Weise Farm, west of Taylor Ridge on September 7.

The joint meeting of Henry, Mercer and Rock Island beekeepers was held at Rock Island on December 8, as described in the Henry County Association report.

For retaining its old members and gaining new ones this association takes the laurels in 1929. With 22 members in 1928, all of these were again affiliated in 1929 with 7 additional new members. How many other local associations can duplicate this feat in 1930.

Mr. S. T. Peterson of 1615 Sixth Avenue, Moline, Illinois, is the Secretary.

Saline-Gallatin Association (15).

(Alvin Bell, Ridgway, Secretary.)

We held our annual meeting at the Equality High School on March 29, 1929. With 50 present. Mr. V. G. Milum and A. L. Kildow were the speakers. The next meeting was at Ora Funkhouser's, Eldorado, on April 26 with 33 present. W. O. Davis, agriculture teacher at Equality brought his class of 20 boys.

The next bee meeting was held at G. F. Wade's on May 24, but only three were present. The next was held at Alvin Bell's on August 16 with only three present.

Our honey crop was short this year in these two counties.

(These counties were included in the annual tour with visits to the apiaries of Raymond Hale at Cottonwood, James Wade of Ridgway, Ora Funkhouser of Eldorado, and Louie Vannis of Harrisburg. An evening meeting was held on the Funkhouser lawn on July 25.)

This association held its 1930 annual meeting at Equality on January 23 with V. G. Milum as the speaker. The election of officers resulted in the retention of H. W. Wilson of Eldorado and Alvin Bell of Ridgway as President and Secretary-Treasurer, respectively. Norval Bean of Eldorado was chosen Vice-President.

Shelby County Association (0).

After a banner year in 1928 with 21 members for an initial organization, this association fell by the wayside in 1929. But we hope that it may again be revived in 1930.

Northwestern Independent Association (10).

This association held a number of meetings during the year. Meetings reported were at the apiaries of W. Brown of Waddams Grove

in May; F. W. Neisman, Winslow on July 21; John Faist, Freeport, August 18; and George Hartman, Freeport on September 15.

The 1930 officers are as follows: President, H. I. Barr, Rock City; Vice-President, A. Cook, Pecatonica; Secretary-Treasurer, Fred Meinen, Baileyville; Directors, George Hartman, Freeport; George Miller, Waddams Grove, and Clayton Kraft of Lena. Meetings are planned for the third Sunday of each month.

Stephenson County Association (10).

If meetings were held in 1929, same were not brought to our attention.

W. H. McCaffrey, 104 East Stevenson Street, Freeport, Illinois, is the Secretary.

Warren County Association (10).
(Glen Glass, Cameron, Secretary.)

Nineteen hundred and twenty-nine was a quiet year in the honey business in Warren County. A good many apiaries came through the winter in a depleted condition due to insufficient stores. The summer experienced the extremes of wet and dry weather which did not prove beneficial to the production of honey. An average of about forty to fifty pounds per colony was reported from the better managed apiaries. However, there was one exception. A large hollow maple tree on the farm of H. J. Moody near Little York yielded 290 pounds of honey when cut in the fall of 1929 by Ralph Frisbee, E. E. Williams, Homer Williams and Clark Ferris.

Whiteside County Association (14).

No report has been received of 1929 activities. The 1929 officers elected on December 27, 1928, were as follows: President, W. G. Lawrence, Fulton; Vice-President, W. C. Rodemacher, Morrison; Secretary-Treasurer, Lou Bradley of Morrison.

Will County Association (1).

This association showed no activity in 1929 but renewed activity with a meeting on January 12, 1930, with 12 members affiliating with the State Association. Mr. A. J. Polcyn, 315 Huchins Street, Joliet, is Secretary-Treasurer.

Williamson County Association (1).

This association showed no activity in 1929, although a stop on the summer tour was made at the apiary of Otis Kelley near Marion.

Woodford County Association (16).
(Alfred E. Thomas, Secor, Secretary.)

This association held its annual meeting and the election of officers at the High School at Eureka. Talks were given by V. G. Milum of Champaign, Ill., John F. Smith of Eureka and Elzo Gray of El Paso. J. P. Scheid of Eureka and Alfred E. Thomas of Secor were reelected President and Secretary-Treasurer, respectively. Lawrence Rocke of Roanoke was elected Vice-President.

A field meeting was held at the apiary of the Secretary, on October 5th with 35 or 40 beekeepers in attendance. Frank C. Pellett of Hamilton, Illinois, spoke at this meeting.

ANNUAL REPORT OF THE CHIEF INSPECTOR OF APIARIES FOR THE YEAR ENDING JUNE 30, 1929.

(A. L. KILDOW, Putnam, Illinois.)

Putnam, Ill., August 26, 1929.

To the Honorable, Louis L. Emmerson, Governor of the State of Illinois.

SIR: I have the honor of hereby submitting my annual report, as State Inspector of Apiaries, showing work done during the year ending June 30th, 1929.

In submitting this report I wish to state that it is a report of actual work done, rather than of the condition of Apiculture.

First, we were handicapped in our inspection work by a shortage of funds; the greater part of our appropriation having been used during the previous year. Hence this season's work was confined to calls for help and to localities where we were satisfied disease existed. In reality this was a clean up year, cleaning where the owners had not been able to cope with the disease, or had been too negligent to do so and were spreading, rather than checking disease.

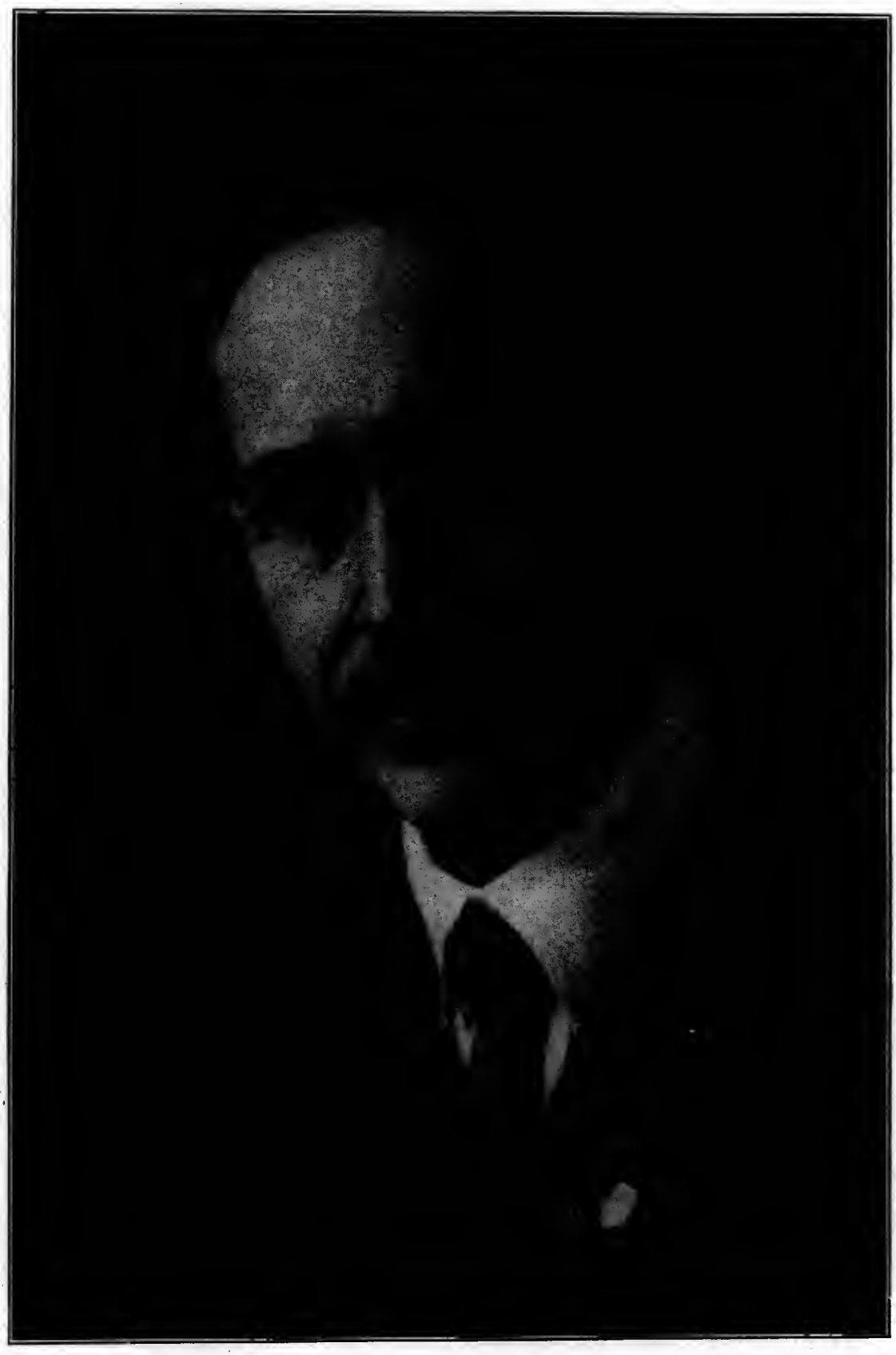
Under these conditions we visited 2,525 apiaries with 34,604 colonies, found 2,419 colonies diseased.

In order to show proper methods of treatment 355 colonies were treated and 1,074 colonies were destroyed. Colonies too badly diseased for treatment were burned. In most cases the only practical way to eradicate the disease is to burn bees, combs and honey. Experience has compelled us to do this.

It would hardly seem reasonable for the State Inspector and deputies to treat all diseased bees in the State, but they can and do thoroughly instruct the beekeepers and assist them in methods of handling disease. One of the best means of instruction is by meetings where the disease is shown, and its eradication explained.

In July the Interstate Bee Meeting was held at Dubuque, Iowa, where the informed and practical beekeepers imparted their knowledge to those present. In the same month the beekeepers of Kane and neighboring counties held a meeting at Elgin where they could discuss foulbrood, its eradication and also methods of keeping bees better, and producing more honey.

The bee tour of 1928 was in August, starting at Bloomington and ending in Peoria where an all day meeting was held at the orchard of Schoff Bros. Here was not only explained the necessity of bees to orchards, but the actual results of the bees work in pollenating the fruit bloom was shown by the good crop of perfect apples. The northern Illinois beekeepers were awake to their interest and on August 11th held



MR. A. L. KILDOW, PUTNAM, ILLINOIS.

State Inspector of Apiaries.

their reunion at DeKalb. On September 19th the beekeepers of Ogle and Lee Counties held their annual meeting at Oregon. Officers were elected for the ensuing year, and plans were discussed with the Chief Inspector as to the best and surest way of treating disease, the decision being to burn.

Edgar and Vermilion Counties formed an Association on September 13th, with V. G. Milum of U. of I. and A. L. Kildow as speakers. In December the beekeepers of the State assembled at Springfield for their annual convention. At the same time thirty deputy inspectors from various parts of the State met for a school of instruction, where plans for the coming season were discussed and formed.

On February 8-9, The American Honey Producers' League held their annual convention at Sioux City, Iowa. A previous call had been issued for all chief inspectors of the different states to assemble for the purpose of forming an organization. A majority of the chief apiary inspectors of the United States were in favor of an organization to further the exchange of information between the inspectors and to obtain uniform inspection laws. This organization was formed and its officers duly elected. The states represented at this meeting were Arkansas, Colorado, Illinois, Iowa, Kansas, Missouri, Nebraska, Ohio, Texas, Washington, D. C., Wisconsin, Wyoming, California, North Dakota, and others. The second resolution passed by this organization was "That colonies diseased with A. F. B. should be burned upon their discovery by an inspector."

March meetings were at Equality, Benton, and Mt. Vernon. The speakers at these meetings were V. G. Milum and A. L. Kildow.

In June the beekeepers of Cook and DuPage counties met at Downers Grove. The object of this meeting was for the eradication of foulbrood and to discuss methods for the advancement of the bee industry, with H. H. Root of Gleanings in Bee Culture and A. L. Kildow, State Inspector, as speakers.

Other meetings were held at different points in the State proving that by study, consultation with others and observing demonstrations, beekeeping is greatly improved.

Another means of improvement is our State Fair. Here is shown what wonderful things can be accomplished by up to date methods of beekeeping. And at our information bureau thousands of questions are kindly answered and explained by competent men. All these combined with co-operation of the beekeepers, inspectors, and the Department of Agriculture is keeping our industry in the front rank.

Respectfully submitted,

A. L. KILDOW,
Chief Inspector, Division of Apiary Inspection.

REPORTS OF DEPUTY INSPECTORS FOR 1929.

JoDaviess County.

(Deputy C. W. Duerrstein, Galena.)

For the year 1929 I visited 168 apiaries and inspected 1,854 colonies. I found 126 infected with A. F. B. These colonies were destroyed by burning which was done by the owner and myself. I found a few with E. F. B. which were requeened.

There was much work to be done as there were so many colonies winter killed and it was necessary to clean up in so many places. Most of my work was done in JoDaviess County, also some was done in Carroll and Stephenson County.

As the fall flow was fairly good, bees have gone into winter with fairly good stores.

Stephenson County.

(Deputy George Schwinn, Orangeville.)

I have this year visited 191 beekeepers, inspected 1,932 colonies of bees, finding 35 cases of A. F. B., and two cases of E. F. B. All were cleaned by order of inspector.

I found those blanks that carry the seal of the State of Illinois and inform the owner or caretaker of disease and that same must be cleaned up by a certain date, quite an inducement to comply with such order. They seem to realize that it means business, especially when the inspector, out of the kindness of his heart, informs them, that if the order is not complied with by that time, they will have the opportunity to explain to the judge why they failed.

Altogether it seems to me there was not overly much disease around here, i. e., in this county, for I got pretty well over the county, even to Bailyville, but I did not go to German Valley as I could not learn of any beekeepers there. At our meeting however, I was assured there were some in the neighborhood.

But finding only a total of 37 yards diseased out of a total of 191 I do not think it is very bad, although I realize that "you've got to keep after it," for if it got a good start the county would soon be "rotten" with it.

I have my bees wrapped up for the winter, trying the newspaper plan advocated by Mr. Lathrop in the last issue of "Gleanings." I want to give each a slap of sugar-candy yet, and then see how they come out in the spring. This "paper-plan" looks pretty good to me. It is not such a muss in the yard as straw or anything else, and I don't see why paper should not keep off wind and cold fully as well as straw, shavings or leaves. That's the reason I'm trying it as I use "top entrance."

Winnebago, Ogle, Lee, LaSalle, Etc., Counties.
(Deputy S. S. Claussen, Oregon.)

In 1929 I visited 199 apiaries, totaling 3,358 colonies of bees, of which 859 were diseased. I burned 767 of them, the rest were treated. These were mostly north of Rockford in Winnebago County. I also worked some in LaSalle. I worked in six different counties.

Some apiaries where I cleaned up and treated in Winnebago County, parties claim they never got such a big crop before.

We have one traveling beekeeper in Ogle County who hauls them back of his car wherever he goes. Last summer he had eight colonies.

DeKalb and Boone Counties.
(Deputy Carl H. Tudor, DeKalb.)

I wish to say that the beekeepers want inspection work and they demand it be done. There are a good many kinds of people that keep bees. The ones that produce honey of any importance or amount are after me continually to get busy with some small fellow with only a few hives. The honey producer keeps himself posted on disease and keeps it under control but he can not keep his bees from going somewhere and bringing it home. DeKalb County Association has a membership to date of 23 paid up members and at our annual meeting on December 14, 1929, they were all very much in favor of a tax or license to keep bees. The State asks for a dog tax and an auto tax, and we can't see why that the State and the Illinois Beekeepers' Association can't get together on this as it would sure help both the State and the man that was interested and trying to make a living and trying to keep disease under control. We of DeKalb County Association think that if the State demanded a tax of $5.00 per stand for the first three stands and a very small amount per stand over that amount, it would sure help in getting rid of disease. Our members argue that it did not take the State long to get rid of the foot and mouth disease for the farmer and the State also paid him for his loss, whereas, we, the beekeepers, are willing to help pay.

I find that I visited 54 yards, containing a total of 1,560 stands of which I inspected 1,067 stands. I found 209 stands infected with A. F. B.; 41 of these were treated and the remainder burned. In most every instance where they were burned, the owner helped with the work. There is a way, if you know how, that an inspector can usually get the other fellow to help.

The north part of DeKalb County and the south part of Boone still had a good deal of A. F. B. last fall and will sure need to be looked after this spring. But that is not bothering me any as I know that it is there. I hope that I am all wrong when I say that I look to find it most any old place in 1930. But you must remember the hard spring of 1929, if there was anything stored in a corner it sure came out. I found it in two yards here in DeKalb this fall and we have had it whipped in these yards ever since 1923. I only found two stands out of

42 in one yard and one stand out of 80 in the other. Where did they get it?

The bees as a whole are in fine shape with plenty of stores in the fall. Clover was never any better and the weather so far has not hurt it any.

DuPage County.

(Deputy Wm. J. Wallanches, Downers Grove.)

Since no inspection was made in DuPage County during the year 1928, no annual report was submitted, and I did not get my notice to do inspection work for 1929 until late in the season.

Nevertheless, I did accomplish quite a good deal, my tour of inspection covering more than half of DuPage County. I inspected a total of 819 colonies, 21 were box hives; 111 were diseased with A. F. B.; 46 were treated by the owner, 10 by the inspector and 55 were destroyed by fire. Of the above total, 36 diseased colonies were moved without a health certificate from a neighboring county to this county (DuPage) during 1928. One of the parties had about a truck load of empty hives with combs, the bees having died of A. F. B.

All the beekeepers had a good crop and my own personal apiary averaged 175 pounds per colony, which is the best crop in years.

The pasture is gradually improving every year. During the last six years, there were thousands of acres of farm land subdivided, on which sweet clover is gradually spreading over the lots.

Cook County.

(Deputy J. R. Wooldridge, Chicago.)

In reviewing the inspection work of the past season in Cook County, it is my opinion the beekeepers of Cook County face a brighter future than for several years past. The county had the most thorough inspection the past season, under the most stringent instructions that have ever been attempted. We have a splendid organization of inspectors, supported by the Cook County Beekeepers' Association in every way possible at all times. This with the increased co-operation of the beekeepers in general is of great assistance in accomplishing what has been done.

I soon learned after starting work in 1929 there must be some strenuous work done and done quickly too, or we faced disaster. About this time I received instructions from Mr. A. L. Kildow, Chief Inspector of Illinois to burn all infected colonies at time found or as soon after as possible. We adhered strictly to these instructions whenever possible, but sometimes we were temporarily retarded by obstinate beekeepers who later yielded without further trouble. We still had some beekeepers who resisted and it was necessary to carry a deputy sheriff with the cleanup crew and the beekeeper had the choice of allowing the men to discharge their duty or go to the station at that time. This was entirely a new view to them when the law became active and they yielded at once. All yards in Cook County were inspected and if any infection found it was disposed of, which never was so rigidly enforced before.

We have reasons to believe there will be many cases of reinfection appear again, but nothing to compare with the spread of 1928 when little inspection could be given with a very late season, and nearly all stores in hives being used up completely in rearing early brood. This appears to have given A. F. B. a wonderful chance to spread with nothing to prevent it.

Beekeeping with all its drawbacks in Cook County seems to be holding its own by having more colonies, larger commercial yards and a greater number of "swarm catchers" which are always joining our ranks during the swarming period.

Rock Island and Mercer Counties.
(Deputy Dow Ripley, Aledo.)

During the year 1929 I visited 90 apiaries consisting of 1,030 colonies. I found 32 with A. F. B. which were burned by either the owner or myself. I found 15 with E. F. B. which were either requeened or old queen killed and let them rear a new queen.

As a whole the beekeepers were very glad for the inspector to examine their bees and were willing to clean up if they had any disease.

In Rock Island County A. F. B. is scarce now where it was the worst two years ago.

In Mercer County I found a bunch of old hives where the bees had all died but one colony and it was about gone with A. F. B. The bees around for a few miles were in bad shape and there is likely some disease that was not located this year.

I believe that the colonies in bee trees and in houses are the ones that give the inspector the most grief, as they are sure to die out and the next year there is more trouble for the beekeepers.

The county associations are a great help in the inspection work. The stronger the association, the more help they are. As some of the beekeepers that are not in favor of inspection, change their minds after being to a meeting and talking to other beekeepers.

We had a very good crop of fine honey this year and the bees went into the winter in excellent shape.

Henry, Bureau and Knox Counties.
(Deputy Elmer Kommer, Woodhull.)

My report as inspector of Henry County will be short this year, as very little work was done, on account of funds being short for inspection purposes, at the time when the most good could be done in the field.

I only made two trips, one was into Knox County, and one was made in Henry and Bureau County, but am pleased to report that no foulbrood was found on either trip.

The last trip was made for the purpose of issuing moving permits of bees into other counties.

Kendall County.

(Deputy John O'Brien, Newark.)

For the year 1929 there were 714 colonies inspected, of which 53 were diseased with American foulbrood. The number treated was 44. There were 370 dead ones and six I burned.

I think I am making headway in cleaning up the disease and the bees as a whole are in much better condition than they were last year. About the same amount of people are handling bees as there were last year.

Grundy County.

(Deputy C. J. Anderson, Morris.)

Apiaries inspected	44
Colonies inspected	436
Apiaries with American foulbrood	3
Colonies with American foulbrood	11
Colonies burned	9
Colonies treated	2
Number of days inspection	6½

This has been a good honey year. We had plenty of white clover and the weather was just right for the harvest. My bees average 132 pounds per colony.

It was too dry this fall so don't expect any white clover the coming season. Farmers haven't planted the usual amount of sweet clover, they say the seed prices are too low.

The bees had all space filled with honey at close of fall flow but have consumed more than usual since then.

The most of the farmers that have bees are landowners so it is very few bees that are moved. So there is less A. F. B. where I have found it. We have plenty of bees in trees and houses and with the careless beekeeper so one that is free from disease must be on the constant watch.

Will County.

(Deputy Valentine W. Heussner, Lemont.)

Here in Will County the year 1929 will go on record for accomplishment over any previous year, beginning with the organization of the Will County Beekeepers' Association. Considerable new territory has been gone over, many new townships were entered into where beekeepers had no knowledge of bee diseases or the work of inspection. While working in this new locality, I found some scattered American foulbrood everywhere. There is still considerable area in this county where no inspection work has been done.

Never before have I found so much poor bee equipment as the present year. This greatly hampers the inspector from accomplishing what he strives for. When entering a certain premise one hot July afternoon, a thought entered my mind. Here is a "Butter-tub Apiary." This would have been a very appropriate name, for seventeen butter tubs comprised this apiary. They were turned upside down in a row and

filled with honey to capacity. This kind of equipment is a menace to bee-keeping and should be condemned by our foulbrood law.

Interest in bee keeping was exceedingly observable the present year, due in general to the fine quality and large yields of honey. With an average of 90 pounds and in many instances running up to 140 pounds per colony.

Bees will go into winter quarters with a better and larger amount of winter stores than in many previous years. With a comparatively good crop of clover, together with a larger proportion of clover seed, especially alsike, a substantial reduction in clover seed prices, is already noticeable, this will be an enticement to farmers who have not been accustomed to clover production, who will take advantage of low seed prices. Hence, a larger acreage in new seeding in this immediate vicinity, and greater prospects for the future honey crop.

An Illinois apiary of miscellaneous hives—the inspectors wish there were less.

Woodford County.

(Deputy Benj. H. Fischer, Roanoke.)

Due to the very unfavorable season and the pause in inspection work in Woodford County in 1928 the percentage of foulbrood infection found in 1929 has shown a marked increase, but with the careful clean up the past year no doubt brings it down to a low percentage again. The disease seems to be all in the western half of the county in spotted area, the eastern one-half being free of American foulbrood so far as I know.

I have had very little trouble with the beekeepers in cleaning up. To those that were new to the disease, a little explanation revealed to

them the ravages of the disease and usually they were willing to clean up. In fact most of them were quite enthusiastic about a thorough clean up. The town of Washburn is an exception of the above, practically all of the bees were kept in box hives. I found that since my previous visit A. F. B. had overwhelmed the town. In one apiary just across the county line, which had apparently about 15 or 20 colonies die of A. F. B., the old combs had been cut out and thrown into an old apple barrel and the barrel left standing where water from the roof of a shed would drip into it and the bees could work at it at will. This was no doubt the reason for the serious outbreak in that town. Having explained to the beekeepers the destructive work of the disease and instructed them how to manage the bees until they can be treated, I think there will be no trouble for a thorough clean up in the spring.

Outside of the town of Washburn every known case of bee disease has been cleaned up in Woodford County.

Livingston, Ford, Kankakee, Iroquois and McLean Counties.
(Deputy J. T. Henricks, Chatsworth.)

As to the 1929 season, I found difficulty in some places in eradicating foulbrood. It seemed to break out somewhat in a way which made me study and think of a plan which I thought might be of some help in keeping foulbrood checked. My idea was as follows: I put an ad in the home newspaper, "Wanting to hear from parties having bees in buildings and trees, etc., which are a nuisance." This surely led me to bees that no one would ever have found and the number of inquiries that I have had since the inspection season closed is surprising.

Some of these places were such that swarms would issue into them every season and then die out by winter and some sooner. These places were 50 per cent diseased. I think if we once get in touch with all this kind of stray places we might be able to keep foulbrood checked better. I am also planning to run ads in different papers of other localities.

County—	No. Colonies.	No. Diseased.
Livingston	2,773	104
Ford	1,060	82
Kankakee	1,162	122
Iroquois	125	34
McLean	110	...
Totals	5,230	342

Iroquois and Vermilion Counties.
(Deputy J. N. Koritz, Buckley.)

In the year 1929 I inspected 143 apiaries of 1,066 colonies. Of this number 104 colonies had A. F. B.; three were in box hives.

I did not get started at the inspection work until late on account of being short of funds and by the first of July they were getting a lot of surplus super on top of the colonies and it made inspection slow.

I find where the inspector gets out early in the season he can accomplish more than any other time of the season as he can go through more colonies easier and quicker and save time and labor.

McLean County.
(Deputy E. C. Heldt, Normal.)

The following is my report for 1929:

Apiaries visited	128
Total No. of colonies	1369
Total No. inspected	1276
Total No. diseased	74
Per cent diseased (of those inspected)	5.8%
Total No. burned by Inspector	41
No. of box hives	131
Per cent of box hives (No. of immovable frame containers)	10%

The honey flow was of excellent quality but the flow was cut short by dry weather. Many colonies were queenless this fall. Also, brood rearing was slow and many colonies are weak in young wintering bees. These two factors will cause heavy winter loss here.

Fulton County.
(Deputy F. R. Belt, Canton.)

In the year 1929 I visited 43 apiaries. I inspected approximately 500 colonies, 105 with A. F. B.

In most places they cleaned up. The County Association has not been very active. The crops are fair. Bees went into winter in good condition.

Macon and Logan Counties.
(Deputy S. A. Tyler, San Jose.)

During the year 1929, I inspected 1752 colonies in 114 yards and found 108 colonies infected with A. F. B. I treated 61 of them and the owners treated 47. I gave two sale permits and four moving permits. All the disease I found this year was in new territory or where I had not been for two or three years.

The bees went in winter in good shape generally. Some did not have a very large per cent of young bees owing to the lack of room for the queen to lay during the last of August and through September. Honey is moving very slow and some of it is poor quality put on the market by the smaller beekeepers with only a few colonies who should have used it themselves but wanted or had to reduce their store account a little and took any old price for it.

Brown, Pike, Morgan, Sangamon, etc., Counties.
(Deputy Harry L. King, Springfield.)

I visited 118 apiaries with 2250 colonies, examining 1837 colonies, of which 64 were found infected with American foulbrood and two with European foulbrood. The number of box hives found was 66.

Around Versailles conditions are much improved over other years. Cleaned up and aim to keep clean. Burned all disease when I found it. Burning disease seems to open up their eyes that we mean business. Cleaned up things at Jacksonville myself when I was there, had one

real job. Some beekeepers think the bees are theirs and all that is needed is a super once in a while, then let them take care of themselves, no matter to them about the other fellow, though some I visited this year found otherwise, to their sorrow. Less disease around the vicinity of Pleasant Hill than when I visited there two years ago.

Macon, etc., Counties.
(Deputy W. H. Synder, Decatur.)

Reporting of activities of the bees and beekeepers in and around the county of Macon, the season of 1929 did not give us the amount of honey that was expected from our apiaries owing to conditions that were beyond our control. The extreme hard winter of 1928-1929 caused a heavy mortality among the bees in central Illinois, and the loss was better than 50 per cent. The number of colonies that were left were in such a weakened condition that the beekeepers were unable to get their bees into condition for the early spring and summer flow. This flow was very stimulating which caused excessive swarming. The fall flow which never is excessive was badly affected by the dearth.

We have had breaks of American foulbrood on either side of Decatur and in localities where there were several apiaries of bees. This outbreak in both cases was traced to where beekeepers fed and exposed honey that was purchased and shipped into Decatur. We do not know what the extent, until the check up this spring. There are a few other places in this vicinity, where we found some evidence of foulbrood. But as a whole will not exceed a total of one per cent.

Winter of 1929-1930 has been very severe. Through these parts it has not seemed to affect the mortality of the bees to more than about 5 per cent. Practically all of the bees through these parts went into winter quarters in the very best of conditions, and we have the promise of a heavy flow from white clover this spring.

Piatt County.
(Deputy Emory Warner, Monticello.)

For the year ending January 1, 1930, I visited during the summer 1992 colonies of which I found 61 colonies with American foulbrood and 28 with European foulbrood.

I believe we are making headway in cleaning up the disease. I found a few more cases of disease in 1929 than I did in 1927 as we worked only a short time in 1928.

In my territory here inspection has helped to educate the beekeepers with the movable frame hive. When I started to inspect in Piatt County, the Bement Lumber Company bee-supply business jumped the first year from between $70.00 and $80.00 to near $500.00 for bee supplies.

The good beekeepers are cooperating with the inspection work as the good farmer is cooperating with the Farm Bureau. But we still have a number of the old fashioned beekeepers who think nothing will kill bees but moth.

We are having our annual meeting of the Piatt County Beekeepers Association at the Court House in Monticello on Monday, January 20, 1930, with Mr. A. G. Gill and V. G. Milum as speakers.

As near as we can figure from the larger beekeepers we have produced in Piatt County this year nearly 45 tons of honey which was selling very slowly but is doing better now.

Bees seem to be wintering pretty well especially those packed.

Jersey County.

(Deputy C. A. Mackelden, Jerseyville.)

During my inspection work for 1929, I found a very great improvement over the previous year. I found that the beekeepers and also the people as well were taking a very active interest in bees and honey, and the beekeepers that had box hives were changing to modern equipment; that is, the majority of them were. I also found all the beekeepers were more anxious to have their bees inspected after they had read the different articles that had appeared in the local papers, relative to bees and bee diseases.

The orchard owners in this locality were also taking a very active interest and were increasing the number of their colonies and were studying more about the benefits of the bee, not only from a commercial standpoint, but for pollenization of the fruit bloom.

Unfortunately, foulbrood had crept into our county from adjoining counties where there has been but little inspection work done. While all of same has not been eradicated, yet, the beekeepers are on the alert and are cooperating with me to keep same to a minimum until the adjoining counties are cleaned of the disease.

The bee industry now bids fair to become one of the leading industries of Jersey County, and as we have so many nectar bearing plants, we produce honey that cannot be excelled by any other county of the State.

Montgomery, Macoupin, Greene, Madison, Bond and Christian Counties.

(Deputy O. W. Kennet, Ohlman.)

In 1929 I visited 433 apiaries, inspected 6062 colonies and found 960 colonies in box hives, 201 colonies with A. F. B. and one with E. F. B.

In almost every case where disease was found I assisted in the burning of them while there, and those that were treated, I treated myself.

I experienced no great difficulty in getting the co-operation of the beekeepers, as most of them are very glad to have the help of the inspectors and will do all they can to prevent the spread of foulbrood.

I had a little trouble with one man last year but I am inclined to think he found that the laws of the State are some greater than he gave them credit for.

There are some very careless beekeepers that are continually doing something to keep plenty of foulbrood on hand from one year to the next. For instance, leaving an old can of honey set from year to year, then setting it out for the bees to clean up, or scatter a batch of old black brood combs around to be robbed out by the bees. These conditions are very discouraging as I am sure that many cases of foulbrood are spread in this way.

Don't keep bees this way. Illinois inspections got this one.

In some cases an old building is used for a honey house that is open to the bees at all times. This is also a dangerous source of infection.

Most of the bees in this section went into winter quarters in very good condition. And our prospects for a honey crop next year are good.

Christian County.
(Deputy Frank Bishop, Taylorville.)

In 1929 I visited twelve apiaries and examined 182 colonies, finding five with American foulbrood, which I burned.

Perry and Randolph Counties.
(Deputy Roy I. Annear, Mulkeytown.)

From July 1, 1928 to July 1, 1929, I inspected in Perry and Randolph Counties about 800 colonies of bees for American foulbrood. About 2 per cent were infected with American foulbrood.

I have had good co-operation with the beekeepers in trying to keep the bees in good shape. The only way American foulbrood can be kept down is to educate the beekeepers so the inspectors won't have all the work to do. The bees in Perry and Randolph Counties are chiefly in patent hives, but very few with full sheets of foundation.

The honey flow has been good for three or four years, mostly from sweet clover. Let us all work together in the beekeeping business in producing and marketing.

Jefferson and Franklin Counties.

(Deputy R. G. Meredith, Whittington.)

In 1928 I did not work very much and did not start until July in 1929. Most of the beekeepers have learned A. F. B. when they see a bad case of it and try to clean it up and most of them make it worse the way they do it.

Starting in July, I did not have time to get all over Franklin County so I visited where disease was found in 1928 and found some new cases and from the way it looked I think the beckeepers have made a mess of trying to clean up.

Then I went to Jefferson County but did not cover all of Jefferson. Some disease was found in Jefferson and I helped clean it up and think it was left in good shape.

Some said they never heard of bees being inspected and asked a good many questions, though no one refused to have the bees inspected.

Hardin, Saline, Gallatin, White and Williamson Counties.

(Deputy Louie Vannis, Harrisburg.)

For the year 1929 I inspected 278 apiaries of 3,935 colonies and found 232 of these to be diseased. Of these there were 29 treated, destroying 203 colonies. Out of 3,935 colonies, 1,607 of these were boxes, logs and bushel baskets upside down. But the beekeepers are pulling away from these boxes and are using modern hives.

I had to serve notice on three beekeepers. Two cleaned up but the other balked and told me if I burned his bees I would have to pay for them, but I burned them and haven't paid yet. The beekeepers at Eldorado sure did work hard with me to keep foulbrood down. If all beekeepers were like that I don't think we would have so much at one time.

This has been a poor year for us here this season, too much rain and cool weather this spring and the same this fall.

County—	No. Colonies	A. F. B.	No. Treated	No. Box Hives
Hardin	43	....	....	5
Saline	1,938	114	9	571
Gallatin	1,169	38	4	694
White	726	78	14	318
Williamson	59	2	2	19
Totals	3,935	232	29	1,607

The number of colonies destroyed was 203. I rechecked on 79 apiaries and found 35 more colonies diseased.

Vermilion and Champaign Counties.
(Deputy W. H. Force, Champaign.)

During the year of 1929, I inspected 2,900 colonies of which I found 154 diseased with American foulbrood and 22 with European foulbrood. A good percent of this disease was found in Vermilion County.

Another inspector's special delight. Will it be a Honey Milk Shake?

STATE LAW ON BEE DISEASES

DESCRIPTION AND TREATMENT

Illinois Department of Agriculture

S. E. PIERSON, Director

SPRINGFIELD

APIARY DIVISION

A. L. KILDOW, Chief Inspector

PUTNAM, ILL.

CIRCULAR NO. 261

NOVEMBER, 1927

The following material relating to bee diseases has been copied from Circular No. 261 (November, 1927), Illinois Department of Agriculture, at the suggestion and by permission of A. L. Kildow, Chief Inspector, Putnam, Illinois.

(Prepared by A. L. Kildow, Chief Inspector, Putnam, Ill.)

This bulletin is published especially to acquaint the public with the destructive bee diseases which are prevalent in the State and to show methods of controlling them. It is not the purpose of the state law to require the destruction of property, but on the contrary to conserve the property of beekeepers as much as possible and to place beekeeping on a paying basis. The owners of bees should do all in their power to eliminate bee diseases, and it is to the interest of every beekeeper, when disease is found among his bees, to observe and carry out treatment recommended. Some of the largest beekeepers in the State have had to fight bee diseases, and lessons thus learned have made them better beekeepers.

The treatments in this bulletin are stated as concisely as possible in order that no one will be confused. If there is any doubt as to whether or not disease exists, write to the State Bee Inspector for assistance.

STATE LAW ON BEE DISEASES.

An Act to prevent the introduction and spread in Illinois of foulbrood among bees, providing for the appointment of a State Inspector of Apiaries and prescribing his powers and duties.

WHEREAS, The disease known as foulbrood exists to a very considerable extent in various portions of this State, which, if left to itself, will soon exterminate the honey-bees; and

WHEREAS, The work done by an individual beekeeper or by a State Inspector is useless so long as the official is not given authority to inspect, and, if need be, to destroy the disease when found; and

WHEREAS, There is a great loss to the beekeeper and fruit growers of the State each year by the devastating ravages of foulbrood;

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly.* That the Governor shall appoint a State Inspector of Apiaries, who shall hold his office for the term of two years, and until his successor is appointed and qualified, and who may appoint one or more assistants, as needed, to carry on the inspection under his supervision. The Inspector of Apiaries shall receive for each day actually and necessarily spent in the performance of his duties the sum of Four Dollars to be paid upon bills of particulars certified to as correct by the said State Inspector of Apiaries, and approved by the Governor.

SEC. 2. It shall be the duty of every person maintaining or keeping any colony or colonies of bees to keep same free from the disease known as foulbrood and from other contagious diseases among bees. All beehives, bee fixtures or appurtenances, where foulbrood or other contagious or infectious disease among bees exist, are hereby declared to be nuisances to be abated as hereinafter prescribed. If the Inspector of Apiaries shall have reason to believe that any apiary is infected by foulbrood or other contagious disease, he shall have power to inspect, or cause to be inspected from time to time, such apiary, and for the purpose of such inspection he, or his assistants, are authorized during reasonable business hours to enter into or upon any farm or premises, or other building or place used for the purpose of propagating or nuturing bees. If said Inspector of Apiaries, or his assistants, shall find by inspection that any person, firm or corporation is maintaining a nuisance as described in this section, he shall notify in writing the owner or occupant of the premises containing the nuisance so disclosed of the fact that such nuisance exists. He shall include in such a notice a statement of the conditions constituting such nuisance, and order that the same be abated within a specified time, and a direction, written or printed,

pointing out the methods which shall be taken to abate the same. Such notice and order may be served personally or by depositing the same in the postoffice properly stamped, addressed to the owner or occupant of the land or premises upon which such nuisance exists, and the direction for treatments may consist of a printed circular, bulletin or report of the Inspector of Apiaries or an extract from same.

If the person so notified shall refuse or fail to abate said nuisance in the manner and in the time prescribed in said notice, the Inspector of Apiaries may cause such nuisance to be abated, and he shall certify to the owner or person in charge of the premises the cost of the abatement and if not paid to him within sixty days thereafter the same may be recovered, together with the costs of action, before any court in the State having competent jurisdiction.

In case notice and order served as aforesaid shall direct that any bees, hives, bee-fixtures or appurtenances shall be destroyed and the owner of such bees, hives, bee-fixtures or appurtenances shall consider himself aggrieved by said order, he shall have the privilege of appealing within three days of the receipt of the notice to the county court of the county in which such property is situated. The appeal shall be made in like manner as appeals are taken to the county court from judgments of justice of the peace. Written notice of said appeal served by mail upon the Inspector of Apiaries shall operate to stay all proceedings until the decision of the county court, which may, after investigating the matter, reverse, modify or affirm the order of the Inspector of Apiaries, who shall serve the same as hereinafter set forth and shall fix a time within which such decision must be carried out.

SEC. 2a. No person shall transport a colony of bees or used bee equipment, except a live queen and her attendant bees in a cage without comb or brood, from one county of this State to another county of this State, without a certificate from the Department of Agriculture, stating that it has, within sixty days before the date of shipment, inspected the colony or equipment and found it to be free from foulbrood.

SEC. 2b. No person shall transport a colony of bees or used bee equipment except a live queen and her attendant bees in a cage without comb or brood, into this State from a state or country having an inspector of apiaries or other officer charged with similar duties, without a certificate stating that the officer has, within sixty days before the date of shipment, inspected the colony or equipment and found it to be free from foulbrood.

No person shall transport a colony of bees or used bee equipment, except a live queen and her attendant bees in a cage without comb or brood, into this State from a state not having an inspector of apiaries or other officer charged with similar duties, unless the shipper or consignee has obtained from the Department of Agriculture, upon making a sufficient showing that the colony or equipment is free from foulbrood, a permit for the shipment into the State.

SEC. 3. The Inspector of Apiaries shall, on or before the second Monday in December of each calendar year, make a report to the Governor and also to the Illinois State Beekeepers' Association, stating the

number of apiaries visited, the number of those diseased and treated, the number of colonies of bees destroyed and the expense incurred in the performing of his duties.

SEC. 4. Any owner of a diseased apiary or appliances taken therefrom, who shall sell, barter or give away any such apiary, appliance, queens or bees from such apiary, expose other bees to the danger of contracting such disease or refuse to allow the Department of Agriculture to inspect such apiary or appliances, and any person who shall violate the provisions of Section 2a or Section 2b of this Act, shall be fined not more than $100.00.

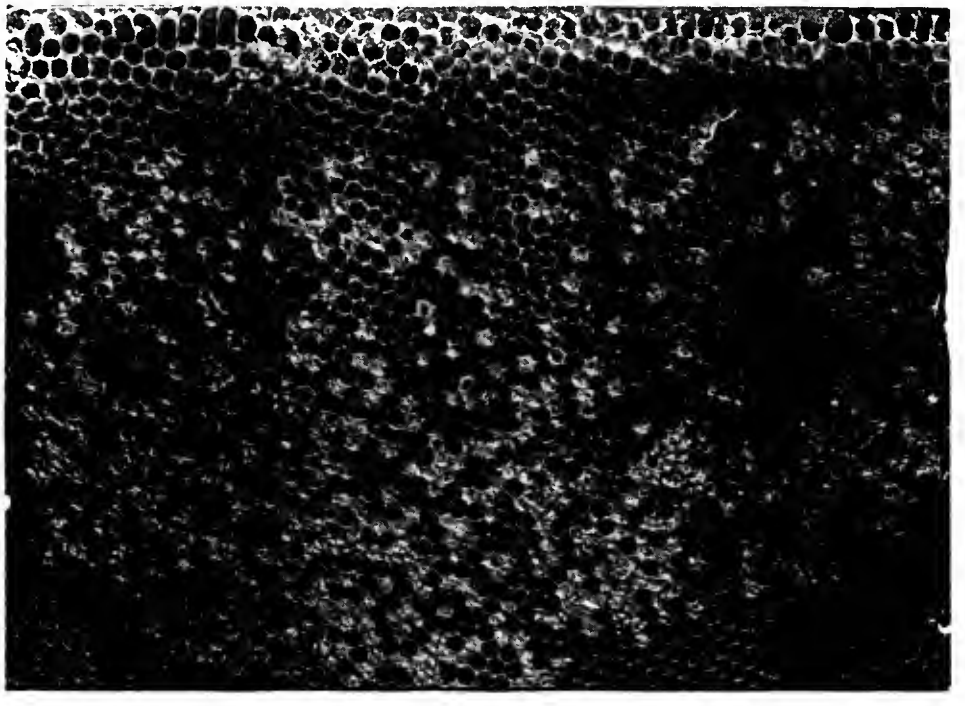
AMERICAN FOULBROOD.

DESCRIPTION.

(Bacillus larvae, White.)

The best description which can be given is that of Dr. E. F. Phillips, in Farmers' Bulletin 442, of the Department of Agriculture.

"American foulbrood usually shows itself in the larva, just about the time that it fills the cell and after it has ceased feeding and has begun pupation (changing from the grub condition to the winged insect).



A Comb of American Foulbrood

At this time, it is sealed over in the comb (by the bees). The first indication of the infection is a slight brownish discoloration and the loss of the well-rounded appearance of the normal larva. At this stage the disease is not usually recognized by the beekeeper. The larva gradually sinks down in the cell and becomes darker in color and the posterior end lies against the bottom of the cell. By the time it has partially dried down and has become quite dark *(brown coffee colored),* the most typical characteristic of this disease manifests itself. If a match, stick or toothpick is inserted into the decaying mass and withdrawn, the larva-remains adhere to it and are drawn out in a thread, which sometimes extends for an inch or more before breaking. This ropiness is the chief characteristic in diagnosing the disease. The larva continues to dry

down and gradually loses its ropiness until it finally becomes merely a scale on the lower side wall and base of the cell. This scale adheres tightly to the cell and can be removed with difficulty from the cell wall. The scales can be observed when the comb is held with the top inclined toward the observer, so that a bright light strikes the lower side wall. A very characteristic and penetrating odor is noticeable in the decaying larva. This can be best likened to the *odor of heated glue.*

"The majority of the larvae which die of this disease are attacked after being sealed in the cells. The cappings are often entirely removed by the bees, but when they are left they usually become sunken and frequently perforated. As the healthy brood emerges, the comb shows the scattered sunken cappings covering dead larvae, giving a characteristic appearance.

"Pupae (the transforming grub, also called chrysalis) also may die of this disease, in which case they, too, dry down, become ropy and have the odor and color. The tongue frequently adheres to the upper side wall and often remains there even after the pupa has dried down to a scale."

Treatment.

Previous to treatment clip the queen's wings when everything has been provided, go to the diseased colony, remove the hive from its stand and put it about three or four feet back. Place a clean empty hive on the old stand with a flat board or flat cover half way over the empty hive body with a brick on it to keep the cover from falling off.

Now smoke the diseased colony just enough to keep them quiet and proceed to take out the frames and shake or brush off the bees in the open half of the empty body, putting the combs in another hive body that you have placed handy to receive them, keeping them covered.

After you have all the bees in the newly prepared hive, close the hive with the board that is already over half of it. Leave the colony two days, then at the end of this time raise the board that is used as a cover about six inches and bring it down on the hive with a quick slam. This will dislodge the bees that have clustered on the under side of the cover or board. Have a hive in close reach with frames and full sheets of foundation, quickly put this prepared hive over the one that has the bees in, the bees will go up in this hive and in the morning lift the top hive off and place it on the bottom board, if any bees are on the sides of the hive body brush them in front of the colony and your treatment is complete.

Now take the diseased combs and burn them. If any comb has been built on the board or cover, this also must be burned. If the inspector finds a colony that is too badly diseased to warrant treatment he may order same burned.

EUROPEAN FOULBROOD.

Description.

European foulbrood usually attacks the larva at an earlier stage of its development than American foulbrood and while it is still curled at the base of the cell. A small percentage of larvae die after capping, but sometimes quite young larvae are attacked. Sunken and perforated cappings may exist as in American foulbrood. The earliest indication of the disease is a slight yellow or gray discoloration and uneasy movement of the larva in the cell. It loses its well-rounded opaque appearance and becomes slightly translucent so that the trachae may become prominent giving the larva a clear segmented appearance. Later the color changes to a decided yellow or gray and the translucency is lost. The yellow color is the chief characteristic of this disease. The dead larva appears as a moist, somewhat collapsed mass, giving the appearance of being melted. The larva finally dries in a grayish-brown scale against the base of the cell, or a shapeless mass on the lower side wall. Very few scales are black. The scales are not adhesive, but easily removed, and the bees carry out a great many of them. Decaying larvae which have died of this disease are usually not ropy as in American foulbrood, but a slight ropiness is sometimes observed. Sometimes a sour odor is present, which reminds one of yeast fermentation.

Treatment.

As soon as the disease shows, kill the old queen, and if the colony is common brown or black, keep all queen cells cut out. Fifteen days after you kill the queen, introduce a young laying Italian queen. If the colony be of good Italian stock, allow the colony to rear a queen. Keep the colony *strong;* a weak colony will not rid themselves of disease.

OLD BOX HIVES.

Remove a portion of the top so you can blow smoke in, turn the hive upside down, and place a box as nearly the size of the old hive as you can get, on top. Smoke into the opening that you have made and drum on the box, until you have all the bees out of the old hive into the box on top.

Place the box containing the bees where the old hive formerly stood. Saturate the old hive and combs with kerosene and destroy as instructed in American foulbrood.

In two or three days dump the bees from the box into a hive body which is placed on the stand where the box was and fill the hive body

with frames of foundation and place the cover on your hive. Destroy all combs that were built in the box.

If there is no disease in the old box hive, the bees may be run on full sheets of foundation at once.

SUGGESTIONS.

By adhering to the following suggestions and avoiding the "Don'ts" the beekeeper may save himself much trouble and worry as well as financial loss.

Don't use frame hives without foundation.

Don't use box hives, bees cannot be controlled in them.

Don't allow robbing in your apiary.

Don't waste your time trying to save a colony with only a handful of bees.

Don't buy everything you see advertised in bee papers, as they may not all fit your conditions.

Leave only a small entrance during spring, until your colonies show by clustering at entrance that a larger opening is necessary.

Keep all colonies strong, even should you have to resort to feeding in order to have the colony breed up. Feed granulated sugar syrup, a pound of sugar to a pound of water.

Use full sheets of foundation in your brood frames.

Keep a good strain of Italian bees.

Read the bee journals. The price of a good bee journal is money well spent.

If you winter your bees out of doors, give them adequate packing, using forest leaves or other absorbents for this purpose. Place at least six inches of leaves over the brood frames and at least four inches of leaves around the hives, except the front, held in place by wire netting.

Black bees and low-grade hybrids are the most susceptible to European foulbrood. Keep only pure Italian bees.

Make an effort to produce more honey this year than ever before.

(Reprint Circular No. 261, Illinois Department of Agriculture.)

APIARY INSPECTORS OF AMERICA.

Minutes of Meeting at Milwaukee, Wisconsin, February 4 and 5, 1930.

Meeting called to order by Vice-President Frank E. Todd.

Roll call by states showed the following representatives present:

1. Alabama ..... Thomas Atchison
2. California ..... Frank E. Todd
3. District of Columbia ..... James I. Hambleton
4. Indiana ..... C. O. Yost
5. Iowa ..... Howard Shipton, representing F. B. Paddock
6. Louisiana ..... W. Whitcomb, representing W. E. Anderson
7. Michigan ..... Russell H. Kelty, representing H. R. Krebs
8. Missouri ..... Dr. K. C. Sullivan
9. Montana ..... O. A. Sippel
10. New Jersey ..... E. G. Carr
11. North Dakota ..... J. A. Munro
12. Ohio ..... Chas. A. Reese
13. Ontario ..... F. E. Millen
14. Texas ..... T. W. Burleson, representing F. L. Thomas
15. Washington ..... Floyd Buck, representing Dr. Webster
16. Wisconsin ..... C. D. Adams
17. Wyoming ..... Wm. Mosteller

BEE JOURNALS.

18. American Bee Journal ..... M. G. Dadant
19. Gleanings ..... Geo. S. Demuth

In addition to these official representatives were quite a number of Deputy Inspectors who helped out in discussions when called upon.

The President, Dr. R. L. Parker of Kansas, found it impossible to attend but sent his presidential address which was read.

The Vice-President, Frank E. Todd, submitted for his address a report on a very important court action in which the validity of the California bee disease statutes was questioned. Unfortunately the decision of the court had not yet been reached, but the authorities cited in the case were extremely interesting to us in showing police limitations.

A number of committees were appointed at this time to report the next day.

The sentiment seemed to be that the resolutions passed last year could stand for the coming year without any change, but the 5th, 6th and 7th were still worthy of discussion and so were again referred to committees.*

* A copy of the 1929 resolutions is appended.

On Wednesday most of the time was taken up by the report of committees and discussions on various subjects pertaining to bee disease eradication. A letter was read from the Post Master General's office in answer to the resolution passed last year in regard to the shipping of package bees without an inspection certificate. This letter indicated that there was no foundation for our complaint but several members insisted that both bees and queens were being accepted and shipped by postmasters in large quantities without health certificates. Mr. James I. Hambleton of the United States bee culture laboratory was requested to investigate the matter and report back to the association.

The committee on Research Recommendations consisting of Chas. Reese, F. E. Millen, O. A. Sippel, E. G. Carr and T. Atchison reported that there was an urgent need of extended research in bee disease problems and that a standing committee be appointed to outline and assist in finding suitable institutions for carrying on the work in the various problems. The names of the members of this committee will be published later.

The committee on Revision of Bee Disease Books and Bulletins consisting of Messrs. Millen, Demuth and M. G. Dadant reported that it was too big a subject to dispose of in the time allotted, and recommended that work be continued on it through the year and a report made at the next meeting. It was moved to continue the committee.

Thomas Atchison, Chairman of the committee on package bees recommended that the certification of package bees be referred to the Southern States Laboratory at Baton Rouge, Louisiana.

T. W. Burleson moved that the chairman appoint a committee to collect information from various states in regard to package bees and queens and make recommendations in a report to the meeting next year. This motion was carried. T. W. Burleson was appointed.

The committee on Bee Journals consisted of George Demuth, James I. Hambleton, M. G. Dadant and C. D. Adams. The chairman reported that while it was evident to all, that mistakes had been made in the past in selecting articles in regard to bee disease control, yet the committee did not deem it wise in any way to muzzle the press, but recommends that greater care be exercised by the editors in the future in the selection of articles so that the state inspectors will not be embarrassed by the appearance of articles advocating control methods long since tried and discarded by those in control of the work, or by articles describing new methods that are apt to prove dangerous in the hands of the inexperienced.

The committee on News Letters consisting of C. D. Adams, C. O. Yost, Howard Shipton and J. A. Munro recommended that an editor be selected who would send out questionnaires to the various state agencies having control of the bee disease work. From the answers received he is to prepare a news letter, preferably every quarter to be sent to those interested.

In the discussion which followed this report it was moved to investigate the possibility of getting at least a part of this information published in the "Pest Survey" sent out monthly from Washington. A

later motion put this matter in the hands of a committee consisting of Messrs. Todd, Sippel, Carr, Adams and Atchison. It was suggested by Mr. Sippel that a column be carried in the Honey Producer for this purpose.

The committee on Apiary Registration consisted of Dr. K. C. Sullivan and F. E. Millen. Dr. Sullivan represents a state where the system has been tried and abandoned, while Mr. Millen represents a province in Canada that has found it very successful. After the discussion it was moved to lay this matter on the table.

The election of officers was next taken up. It was voted to reelect the present officers for the coming year. These are Dr. R. L. Parker of Kansas, President, Frank E. Todd, California, Vice-President, and C. D. Adams, Secretary, Wisconsin.

FRANK E. TODD, *Vice-President,*
C. D. ADAMS, *Secretary.*

1929 RESOLUTIONS READOPTED AT 1930 MEETING.

Be It Resolved:

1. That this association meet with the A. H. P. League in its annual convention.
2. That colonies diseased with American foul brood should be burned upon their discovery by an inspector.
3. That we favor the "area clean up" plan.
4. That we favor the certification of bees and used bee equipment in interstate and intrastate shipments.
5. That the Bee Culture press continue its policy of careful selection for publication of articles dealing with various phases of bee diseases.
6. That we urgently request that the U. S. Post Office Department immediately impose regulations on the shipment of bees and used bee supplies in conformity with those now imposed upon the express companies in compliance with the various state laws.
7. That we are opposed to the compulsory registration of apiaries and collection of a special per colony tax for the state inspection service.
8. That we favor the collection of apiary statistics for the aid of this organization and the individual inspection services.

C. D. ADAMS, *Chairman,*
R. G. RICHMOND,
J. A. MUNRO.

FORMATION OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION.

SPRINGFIELD, ILL., *February 26, 1891.*

The Capitol Beekeepers' Association was called to order by President P. J. England.

Previous notice having been given that an effort would be made to form a State Association, and there being present beekeepers from different parts of the State, by motion, a recess was taken in order to form such an association.

P. J. England was chosen temporary chairman and C. E. Yocum temporary secretary. On motion, the Chair appointed Thos. G. Newman, C. P. Dadant and Hon. J. M. Hambaugh a Committee on Constitution.

Col. Charles F. Mills addressed the meeting on the needs of a State association and stated that it was his opinion that the beekeepers should have a liberal appropriation for a State Apirian Exhibit at the World's Columbia Exposition.

A motion to adjourn 'till 1:30 p. m. prevailed.

AFTERNOON SESSION.

The Committee on Constitution reported a form for same which, on motion, was read by the Secretary, by sections serially.

Geo. F. Robbins moved to substitute the word "shall" for "may" in the last clause of Section 1, Article III. This led to a very animated discussion, and the motion was lost.

J. A. Stone moved to amend the above-named section by striking out the word "ladies" and all that followed of the same section, which motion led to further discussion, and motion finally prevailed.

Section 2, Article II, relating to a quorum, was on motion, entirely stricken out.

Mr. Robbins moved to amend Article V by adding the words "Thirty days' notice having been given to each member." Prevailed.

Thos. G. Newman moved to adopt the Constitution, so amended, as a whole. Which motion prevailed.

(See Constitution).

J. A. Stone moved that the Chair appoint a Nominating Committee of three on permanent organization. Prevailed.

Chair appointed as such committee, Col. Charles F. Mills, Hon. J. M. Hambaugh and C. P. Dadant.

Committee retired and in a few minutes returned, submitting the following named persons as candidates for their respective offices:

For President—P. J. England, Fancy Prairie.

For Vice-Presidents—Mrs. L. Harrison, Peoria; C. P. Dadant, Hamilton; W. T. F. Petty, Pittsfield; Hon. J. M. Hambaugh, Spring; Dr. C. C. Miller, Marengo.

Secretary—Jas. A. Stone, Bradfordton.

Treasurer—A. N. Draper, Upper Alton.

Mr. Black moved the adoption of the report of the Committee on Nominations. The motion prevailed, and the officers as named by the committee were declared elected for the ensuing year.

Hon. J. M. Hambaugh moved that Mr. Thos. G. Newman, Editor, American Bee Journal, of Chicago, be made the first honorary member of the association. Prevailed.

At this point, Col. Chas. F. Mills said:

"Mr. Chairman, I want to be the first one to pay my dollar for membership," at the same time suiting his action to his words, and others followed his example, as follows:

CHARTER MEMBERS.

Col. Charles F. Mills, Springfield.
Hon. J. M. Hambaugh, Spring.
Hon. J. S. Lyman, Farmingdale.
C. P. Dadant, Hamilton.
Chas. Dadant, Hamilton.
A. N. Draper, Upper Alton.
S. N. Black, Clayton.
Aaron Coppin, Wenona.
Geo. F. Robbins, Mechanicsburg.
J. W. Yocum, Williamsville.
Thos. S. Wallace, Clayton.
A. J. England, Fancy Prairie.
P. J. England, Fancy Prairie.
C. E. Yocum, Sherman.
Jas. A. Stone, Bradfordton.

HONORARY MEMBERS.

1891—Thos. G. Newman, Editor American Bee Journal, Chicago.
1892—Frank Benton, Agricultural Dept., Washington, D. C.
Rev. W. F. Clarke, Guelph, Ontario.
1893—Rev. A. H. Bates, Springfield.
Col. Chas. F. Mills, Springfield.
1894—Geo. W. York, Chicago.
(Now Editor Bees and Honey, Alhambra, California.)
A. I. Root, Medina, Ohio.
W. Z. Hutchinson, Flint, Michigan.
E. R. Root, Medina, Ohio.
C. P. Dadant, Hamilton, Illinois.
Jas. A. Stone, Farmingdale, Illinois.
Dr. C. C. Miller, Marengo, Illinois.
E. D. Townsend, Altmont, Michigan.
Dr. E. F. Phillips, Cornell University, Ithaca, N. Y.
(These last six names were listed on page 207, 19th Report—1919.)
Aaron Coppin, Wenona, Illinois.
1928—Dr. A. C. Baxter, Springfield.
A. L. Kildow, Putnam.

STATE CHARTER

STATE OF ILLINOIS—DEPARTMENT OF STATE.

Isaac N. Pearson, Secretary of State.

To all to whom these presents shall come—GREETINGS:

Whereas, A certificate duly signed and acknowledged having been filed in the office of the Secretary of State on the 27th day of February, A. D. 1891, for the organization of the Illinois State Beekeepers' Association, under and in accordance with the provisions of "An Act Concerning Corporations," approved April 18, 1872, and in force July 1, 1872, and all acts amendatory thereof, a copy of which certificate is hereunto attached.

Now, Therefore, I, Isaac N. Pearson, Secretary of State of the State of Illinois, by virtue of the powers and duties vested in me by law, do hereby certify that the said, The Illinois State Beekeepers' Association; is a legally organized corporation under the laws of the State.

In Testimony Whereof, I hereunto set my hand and cause to be affixed the great seal of State.

Done at the city of Springfield, this 27th day of February, in the year of our Lord one thousand eight hundred and ninety-one, and the Independence of the United States the one hundred and fifteenth.

[SEAL] I. N. PEARSON, *Secretary of State.*

STATE OF ILLINOIS, } ss.
County of Sangamon }

To Isaac N. Pearson, Secretary of State:

We, the undersigned, Perry J. England, Jas. A. Stone, and Albert N. Draper, citizens of the United States, propose to form a corporation, under an act of the General Assembly of the State of Illinois, entitled, "An Act Concerning Corporations," approved April 18, 1872, and all acts amendatory thereof; and for the purpose of such organizations, we hereby state as follows to-wit:

1. The name of such corporation is, The Illinois State Beekeepers' Association.

2. The object for which it is formed is to promote the general interests of the pursuit of bee-culture.

3. The management of the aforesaid Association shall be vested in a board of three Directors, who are to be elected annually.

4. The following persons are hereby selected as the Directors, to control and manage said corporation for the first year of its corporate existence, viz: Perry J. England, Jas. A. Stone, and Albert N. Draper.

5. The location is in Springfield, in the county of Sangamon, State of Illinois.

(Signed) PERRY J. ENGLAND,
JAS. A. STONE,
ALBERT N. DRAPER.

STATE OF ILLINOIS, } ss.
Sangamon County, }

I. S. Mendenhall, a notary public in and for the county and State aforesaid, do hereby certify that on this 26th day of February, A. D. 1891, personally appeared before me, Perry J. England, James A. Stone, and Albert N. Draper, to me personally known to be the same persons who executed the foregoing certificate, and severally acknowledged that they had executed the same for the purpose therein set forth.

In witness whereof, I have hereunto set my hand and seal the day and year above written.

[SEAL] S. MENDENHALL, *Notary Public.*

CONSTITUTION AND BY-LAWS OF THE ILLINOIS STATE BEEKEEPERS' ASSOCIATION.

CONSTITUTION.

ADOPTED FEB. 26, 1891.

ARTICLE I.

This organization shall be known as The Illinois State Beekeepers' Association, and its principal place of business shall be at Springfield, Illinois.

ARTICLE II—OBJECT.

Its object shall be to promote the general interests of the pursuit of beeculture.

ARTICLE III—MEMBERSHIP.

SECTION 1. Any person interested in apiculture may become a member upon the payment to the Secretary of an annual fee of one dollar and fifty cents ($1.50). (Amended to $1.75, 1919; amended to $1.00 at annual meeting December, 1928). And any affiliating association, as a body may become members on payment of an aggregate fee of fifty cents (50c) per member, as amended November, 1910. (Associations must have affiliated 10 or more members in one of two previous years.)

SEC. 2. Any person may become honorary member by receiving a majority vote at any regular meeting.

ARTICLE IV.—OFFICERS.

SECTION 1. The officers of this association shall be, President, Vice President, Secretary and Treasurer. (Since amended to include 5 regional Vice Presidents.) Their terms of office shall be for one year, or until their successors are elected and qualified.

SEC. 2. The President, Secretary and Treasurer shall constitute the Executive Committee.

SEC. 3. Vacancies in office—by death, resignation and otherwise—shall be filled by the Executive Committee until the next annual meeting.

ARTICLE V.—AMENDMENTS.

This Constitution shall be amended at any annual meeting by a two-thirds vote of all the members present—thirty days' notice having been given to each member of the association.

BY-LAWS.

ARTICLE I.

The officers of the association shall be elected by ballot and by a majority vote.

ARTICLE II.

It shall be the duty of the President to call and preserve order at all meetings of this association; to call for all reports of officers and committees; to put to vote all motions regularly seconded; to count the vote at all elections, and declare the results; to decide upon all questions of order, and to deliver an address at each annual meeting.

ARTICLE III.

The Vice Presidents shall be numbered, respectively, First, Second, Third, Fourth, and Fifth, and it shall be the duty of one of them, in his respective order, to preside in the absence of the President.

ARTICLE IV.

SECTION 1. It shall be the duty of the Secretary to report all proceedings of the association, and to record the same, when approved, in the Secretary's book; to conduct all correspondence of the association, and to file and preserve all papers belonging to the same; to receive the annual dues and pay them over to the Treasurer, taking his receipt for the same; to take and record the name and address of every member of the association; to cause the Constitution and By-Laws to be printed in appropriate form and in such quantities as may be directed by the Executive Committee from time to time, and see that each member is provided with a copy thereof; to make out and publish annually, as far as practicable, statistical tables showing the number of colonies owned in the spring and fall, and the amount of honey and wax produced by each member, together with such other information as may be deemed important, or be directed by the Executive Committee; and to give notice of all meetings of the association in the leading papers of the State, and in the bee journals at least four weeks prior to the time of such meeting.

SEC. 2. The Secretary shall be allowed a reasonable compensation for his services, and to appoint an assistant Secretary if deemed necessary.

ARTICLE V.

It shall be the duty of the Treasurer to take charge of all funds of the association, and to pay them out upon the order of the Executive Committee, taking a receipt for the same; and to render a report of all receipts and expenditures at each annual meeting.

ARTICLE VI.

It shall be the duty of the Executive Committee to select subjects for discussion and appoint members to deliver addresses or read essays, and to transact all interim business.

ARTICLE VII.

The meeting of the association shall be, as far as practicable, governed by the following order of business:

Call to order.
Reading minutes of last meeting.
President's address.
Secretary's report.
Treasurer's report.
Reports of committees.
Unfinished business.
Reception of members and collection.
Miscellaneous business.
Election and installation of officers.
Discussion.
Adjournment.

ARTICLE VIII.

These By-Laws may be amended by a two-thirds vote of all the members present at any annual meeting.

C. E. YOCUM,
AARON COPPIN,
GEO. F. ROBBINS.

BEEKEEPERS' ASSOCIATION.

THE ORIGINAL BILL.

§ 1. Appropriates $1,000 per annum— proviso
§ 2. How drawn.
§ 3. Annual Report.

AN ACT *making an appropriation for the Illinois State Beekeepers' Association.*

WHEREAS, The members of the Illinois State Beekeepers' Association have for years given much time and labor without compensation in the endeavor to promote the interests of the beekeepers of the State; and,

WHEREAS, The importance of the industry to the farmers and fruitgrowers of the State warrants the expenditure of a reasonable sum for the holding of annual meetings, the publication of reports and papers containing practical information concerning beekeeping, therefore, to sustain the same and enable this organization to defray the expenses of annual meetings, publishing reports, suppressing foulbrood among bees in the State, and promote the industry in Illinois;

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That there be and is hereby appropriated for the use of the Illinois State Beekeepers' Association the sum of one thousand dollars ($1,000) per annum for the year 1917-1918, for the purpose of advancing the growth and developing the interests of the beekeepers of Illinois, said sum to be expended under the direction of the Illinois State Beekeepers' Association for the purpose of paying the expenses of holding annual meetings, publishing the proceedings of said meetings, suppressing foulbrood among bees in Illinois, etc.

Provided, however, That no officer or officers of the Illinois State Beekeepers' Association shall be entitled to receive any moneys compensation whatever for any services rendered for the same, out of this fund.

SEC. 2. That on the order of the President, countersigned by the Secretary of the Illinois State Beekeepers' Association, and approved by the Governor, the Auditor of Public Accounts shall draw his warrant on the Treasurer of the State of Illinois in favor of the treasury of the Illinois State Beekeepers' Association for the sum herein appropriated.

SEC. 3. It shall be the duty of the Treasurer of the Illinois State Beekeepers' Association to pay out of said appropriation, on itemized and receipted vouchers, such sums as may be authorized by vote of said organization on the order of the President countersigned by the Secretary, and make annual report to the Governor of all such expenditures, as provided by law.

Itemized in the Omnibus Bill as follows:

For shorthand reporting	$200.00
For postage and stationery	50.00
For printing	550.00
Expense of meetings	200.00
Total amount of the appropriation	$1,000.00

The Assembly ruled that this is not to be paid in LUMP, but drawn on itemized accounts.

CODE OF RULES AND STANDARDS FOR GRADING APIARIAN EXHIBITS AT FAIRS AS ADOPTED BY ILLINOIS STATE BEEKEEPERS' ASSOCIATION.

Comb Honey.

Rule 1. Comb honey shall be marked on a scale of 100, as follows:

Quantity	40	Style of display	20
Quality	40		

Rule 2. Points of quality should be:

Variety	5	Straightness of comb	5
Clearness of capping	10	Uniformity	5
Completeness of capping	5	Style of section	5
Completeness of filling	5		

Remarks: 1. By variety is meant different kinds, with regard to the sources from which the honey is gathered, which adds much interest to an exhibit.

2. By clearness of capping is meant freedom from travel stain and a water soaked appearance. This point is marked a little high, because it is a most important one. There is no better test of the quality of comb honey than the appearance of the cappings. If honey is taken off at the proper time, and cared for as it should be, so as to preserve its original clear color, body and flavor will take care of themselves, for excellence in the last two points always accompanies excellence in the first. Clover and basswood honey should be white; heartease, a dull white tinged with yellow; and Spanish needle, a bright yellow.

3. By uniformity is meant closeness of resemblance in the sections composing the exhibit.

4. By style is meant neatness of the sections, freedom from propolis, etc.

5. Honey so arranged as to show every section should score the highest in style of display, and everything that may add to the tastiness and attractiveness of an exhibit should be considered.

Extracted Honey.

Rule 1. Extracted honey should be marked on a scale of 100, as follows:

Quantity	40	Style and display	15
Quality	45		

Rule 2. Points of quality should be:

Variety	10	Style of package	10
Clearness of color	5	Variety of package	5
Body	5	Finish	5
Flavor	5		

Remarks: 1. Light clover honey pouring out of a vessel is a very light straw color; Spanish needle, a golden hue, and dark clover honey, a dull amber.

2. Style of package is rated a little high, not only because in that consists the principal beauty of an exhibit of extracted honey, but also because it involves the best package for marketing. We want to show honey in the best shape for the retail trade, and that, in this case, means the most attractive style for exhibition. Glass packages should be given the preference

over tin; flint glass over green, and smaller vessels over larger, provided the latter run over one or two pounds.

3. By variety of package is meant chiefly different sizes; but small pails for retailing, and, in addition, cans or kegs (not too large) for whole-saleing may be considered. In the former case, pails painted in assorted colors, and lettered "Pure Honey," should be given the preference.

4. By finish is meant capping, labeling, etc.

5. Less depends upon the manner of arranging an exhibit of extracted than of comb honey, and for that reason, as well as to give a higher number of points to style of package, a smaller scale is allowed for style of display.

Samples of Comb and Extracted Honey.

Rule 1. Single cases of comb honey, entered as such for separate premiums, should be judged by substantially the same rules as those given for a display of comb honey, and samples of extracted, by those governing displays of extracted honey.

Rule 2. Samples of comb or extracted honey, as above, may be considered as part of the general display in their respective departments.

Granulated Honey.

Rule 1. Candied or granulated honey should be judged by the rules for extracted honey, except as below.

Rule 2. Points of quality should be:

Variety	10	Style of package	10
Fineness of grain	5	Variety of package	5
Color	5	Finish	5
Flavor	5		

Rule 3. An exhibit of granulated honey may be entered or considered as part of a display of extracted honey.

Nuclei of Bees.

Rule. Bees in observation hives should be marked on a scale of 100, as follows:

Color and markings	30	Quietness	5
Size of bees	30	Style of comb	5
Brood	10	Style of hive	10
Queen	10		

Remarks: 1. Bees should be exhibited only in the form of single frame nuclei, in hives or cages with glass sides.

2. Italian bees should show three or more bands, ranging from leather color to golden or light yellow.

3. The markings of other races should be those claimed for those races in their purity.

4. A nucleus from which the queen is omitted should score zero on that point.

5. The largest quantity of brood in all stages or nearest to that should score the highest in that respect.

6. The straightest, smoothest and most complete comb with the most honey consistent with the most brood, should score the highest in that respect.

7. That hive which is neatest and best made and shows the bees, etc., to the best advantage should score the highest.

Queen Bees.

Rule. Queen bees in cages should be marked on a scale of 100, as follows:

Quantity	40	Quality and variety	40
Style of caging and display	20		

Remarks: 1. The best in quality consistent with variety should score the highest. A preponderance of Italian queens should overweigh a preponderance of black ones, or, perhaps, of any other race or strain; but sample queens of any or all varieties should be duly considered. Under the head of quality should also be considered the attendant bees. There should be about a dozen with each queen.

2. Neatness and finish of cages should receive due consideration, but the principal points in style are to make and arrange the cages so as to show the inmates to the best advantage.

Beeswax.

Rule. Beeswax should be marked on a scale of 100, as follows:

Quantity	40	Quality	40
Style of display	20		

Remarks: 1. Pale, clear, yellow specimens should score the highest, and the darker grades should come next in order.

2. By style is meant chiefly the forms in which the wax is molded and put up for exhibition. Thin cakes or small pieces are more desirable in the retail trade than larger ones. Some attention may be given to novelty and variety.

BEES AND HONEY PREMIUM WINNERS—1929 ILLINOIS STATE FAIR.

Class J. Apiary—Amount Offered, $574.00.

T. P. Smith, Danville.....Member in Charge
Dr. A. C. Baxter, Springfield.....Superintendent
C. A. Mackelden, Jerseyville.....Judge

Case of White Comb Honey, 24 sections. Joseph H. Bearden, 1014 No. Snodgrass St., Taylorville, Ill., 1st. Frank Bishop, Taylorville, Ill., 2nd. Mrs. Isabelle Coppin, Wenona, Ill., 3rd. Elmer Kommer, R. No. 2, Woodhull, Ill., 4th. Lawrence Peterson & Son, Kewanee, Ill., 1325 Pine St., 5th. J. A. Stone & Sons, Farmingdale, Ill., 6th. Walter Wright, Putnam, Ill. 7th.

Case of amber honey, 24 sections. Elmer Kommer, 1st. Frank Bishop, 2nd. Lawrence Peterson & Son, 3rd.

Frame of comb honey for extracting. Frank Bishop, 1st. Elmer Kommer, 2nd. Mrs. Isabelle Coppin, 3rd. Joseph H. Bearden, 4th. Lawrence Peterson & Son, 5th.

Collection of labeled cases containing 12 or more sections of white and amber honey. Elmer Kommer, 1st. Frank Bishop, 2nd. Mrs. Isabelle Coppin, 3rd. Walter Wright, 4th. J. A. Stone & Sons, 5th.

Display of light extracted honey, 40 to 60 lbs. Mrs. Isabelle Coppin, 1st. Joseph H. Bearden, 2nd. Elmer Kommer, 3rd. Frank Bishop, 4th. Lawrence Petterson & Son, 5th. J. A. Stone & Sons, 6th.

Display of amber extracted honey, 40 to 60 lbs. Joseph H. Bearden, 1st. Frank Bishop, 2nd. Elmer Kommer, 3rd. Mrs. Isabelle Coppin, 4th. Lawrence Peterson & Son, 5th. J. A. Stone & Sons, 6th.

Display of extracted honey. Joseph H. Bearden, 1st. Frank Bishop, 2nd. Elmer Kommer, 3rd. Mrs. Isabelle Coppin, 4th. Lawrence Peterson & Son, 5th. J. A. Stone & Sons, 6th.

Display of candied honey. Frank Bishop, 1st. Elmer Kommer, 2nd. J. A. Stone & Sons, 3rd. Lawrence Peterson & Son, 4th. Mrs. Isabelle Coppin, 5th.

One frame observatory hive, three banded Italian bees with Queen. Joseph H. Bearden, 1st. Frank Bishop, 2nd. Elmer Kommer, 3rd. Lawrence Peterson & Son, 4th.

One frame observatory hive, Golden Italian bees with Queen. Elmer Kommer, 1st. Frank Bishop, 2nd.

Display of beeswax and designs in wax, not less than 50 pounds of wax. Mrs. Isabelle Coppin, 1st. Joseph H. Bearden, 2nd. Elmer Kommer, 3rd. Frank Bishop, 4th. Jas. A. Stone & Sons, 5th. Lawrence Peterson & Son, 6th.

Honey Vinegar, one-half gallon, with recipe for making. Mrs. Isabelle Coppin, 1st. Frank Bishop, 2nd. Elmer Kommer, 3rd.

Sweepstakes. Frank Bishop, 1st. Elmer Kommer, 2nd. Mrs. Isabelle Coppin, 3rd. Joseph H. Bearden, 4th. Walter Wright, 5th.

GENERAL INFORMATION FOR BEEKEEPERS.

Bee-Journals Published in the United States:

	Regular Subscription	To Assn. Members
American Bee Journal, Hamilton, Ill.....	$1.00	50c
Beekeepers' Item, Box 838, San Antonio, Texas	1.00	75c
Beekeepers' Review, Almont, Mich.....	.50	50c
Bees and Honey, 1124 Westminister Ave., Alhambra, California	1.00	75c
Dixie Beekeepers, Waycross, Ga.....	1.00	75c
Gleanings in Bee Culture, Medina, Ohio....	.90 (2 yrs.)	50c (1 yr.)

(The publishers will furnish sample copies upon request.)

Several trade and state associations publish journals or circulars of information for their membership as follows:

The American Honey Producer—Official organ of The American Honey Producers' League. (With membership at $1.50 per year, otherwise 75c per year.)

Wisconsin Beekeeping.

Monthly bulletin Illinois State Beekeepers' Association. (50c to non-members.)

Beecause. 12c. G. B. Lewis Co., Watertown, Wis.

Free Literature and Circulars on Bees and Honey.

Bureau of Entomology, U. S. Dept. of Agriculture.

Most state experiment stations have bulletins or mimeographed materials.

A. I. Root Co., Medina, Ohio—The Bee Hive.

Kellogg Co., Battle Creek, Michigan.

Recipe pamphlets: Do you like Honey? Cooking with Honey. Do you use Honey?

All-Bran poster, featuring a jar of honey.

Full page advertisement, featuring honey.

Recipe labels for honey containers.

Manufacturers of Bee Supplies.

The names of the leading bee supply manufacturers can be obtained by reading the advertisements in the bee journals. They will furnish catalogues upon request.

Shippers of Bees and Queens.

Consult the bee journals. The person or firm that remains in business over a period of years is usually the most reliable. When in doubt as to the reliability of any particular advertiser, write to the editors for definite information.

Books on Bees and Beekeeping.

	PRICE.
Atkins and Hawkins—How to Succeed with Bees	$ .59
Campbell, C. P.—The Law of the Honey Bee	1.00
Dadant, C. P.—First Lessons in Beekeeping	1.00
The Dadant System of Beekeeping	1.00
New Observations Upon Bees—By Huber	3.00
Dadant, M. G.—Out Apiaries	1.00
Doolittle, G. M.—Scientific Queen Rearing	.50
Hawkins, K.—Beekeeping in the South	1.00
Langstroth & Dadant—The Honey-Bee	2.50
Lovell, J. H.—Honey Plants of North America	2.50
Miller, C. C.—Fifty Years Among the Bees	1.50
1,000 Answers to Beekeeping Questions	1.25
Pellet, F. C.—American Honey Plants	3.00
Productive Beekeeping	3.00
Practical Queen Rearing	1.00
Beginner's Bee Book	1.50
Phillips, E. F.—Beekeeping	4.00
Quinby, M.—Mysteries of Beekeeping Explained	1.00
Rowe, H. G.—Starting Right With Bees	.75
Smith, Jay—Queen Rearing Simplified	1.25
Snodgrass—Anatomy and Physiology of the Honey Bee	3.50
Root—A B C & X Y Z of Beekeeping	2.50

Any of this list of books can be purchased from the bee supply manufacturers or the beekeeping journals. Every beekeeper should read several of these books.

Advantages of Membership in State or County Beekeeping Associations.

1. Education on proper methods of managing bees which means bigger crops of quality honey marketed at quality prices.
2. United action and cooperation in the eradication of bee diseases.
3. Reduced rates on subscription to bee journals and free subscription to the association news.
4. Savings on bee supplies by ordering collectively.
5. Uniform prices for honey through cooperative marketing.
6. Acquaintance and friendship of brother beekeepers, developing a spirit of mutual helpfulness.

Diseases of Bees and Apiary Inspection.

Illinois State Apiary Inspection—Mr. A. L. Kildow, Putnam, Illinois, Chief Inspector. State Law on Bee Diseases—Circular No. 261.

EXTRACT FROM CIRCULAR OF INFORMATION.

Bee Culture Laboratories, Bureau of Entomology
United States Department of Agriculture
Washington, D. C.

BULLETINS FOR FREE DISTRIBUTION.

Farmer's Bulletin 447, Bees.
Farmer's Bulletin 653, Honey and its Uses in the Home.
Farmer's Bulletin 961, Transferring Bees to Modern Hives.
Farmer's Bulletin 975, Control of European Foulbrood.
Farmer's Bulletin 1012, Preparation of Bees for Outdoor Wintering.
Farmer's Bulletin 1014, Wintering Bees in Cellars.
Farmer's Bulletin 1039, Commercial Comb Honey Production.
Farmer's Bulletin 1198, Swarm Control.
Farmer's Bulletin 1215, Beekeeping in the Clover Region.
Farmer's Bulletin 1216, Beekeeping in the Buckwheat Region.
Farmer's Bulletin 1222, Beekeeping in the Tulip-tree Region.
Department Circ. 24, United States Grades, Color Standards, and Packing Requirements for Honey. A chart showing requirements for grades of honey and a circular on labels or stamps for honey grades are included in this circular.
Department Circ. 218, Occurrence of Diseases of Adult Bees.
Department Circ. 222, Insulating Value of Commercial Double-Walled Hives.
Department Circ. 284, The Sterilization of American Foulbrood Combs.
Department Circ. 287, Occurrence of Diseases of Adult Bees, II.

INTEREST TO BEEKEEPERS.

Farmer's Bulletin 1005, Sweet Clover on Corn Belt Farms.
Farmer's Bulletin 1062, Buckwheat.
Farmer's Bulletin 1151, Alsike Clover.
Farmer's Bulletin 1283, How to Grow Alfalfa.
Farmer's Bulletin 1411, Crimson Clover, Seed Production.

BULLETINS FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS.

The following publications are not available in the Department of Agriculture but may be purchased at the prices indicated. Remittances should be made to the Superintendent of Documents, Government Printing Office, Washington, D. C., by postal money order, ex-

press order or New York draft. If currency is sent, it will be at sender's risk. Postage stamps, defaced or worn coins, foreign coins and uncertified checks will not be accepted.

Department Bulletin 431, Sacbrood .....10 cents
Department Bulletin 804, A Study of the Behavior of European Foulbrood of Bees in the Colony ..... 5 cents
Department Bulletin 809, American Foulbrood .....15 cents
Department Bulletin 810, European Foulbrood .....10 cents
Department Bulletin 988, Heat Production of Honeybees in Winter ..... 5 cents
Department Bulletin 1222, Growth and Feeding of Honeybee Larvae .....10 cents
Department Bulletin 1328, Flight Activities of the Honeybee.10 cents
Department Bulletin 1339, Effect of Weather upon the Change in Weight of a Colony of Bees during the Honeyflow.....10 cents
Department Bulletin 1349, Brood-Rearing Cycle of the Honeybee .....10 cents
Department Bulletin 1364, "Effects on Honeybees of Spraying Fruit Trees with Arsenicals"..... 5 cents

Comb honey grading chart may be purchased for 15 cents. This chart is also printed in four colors.

Farmer's Bulletin 797, Sweet Clover; Growing the Crop.....(5c)
Farmer's Bulletin 820, Sweet Clover; Utilization .....(5c)
Farmer's Bulletin 836, Sweet Clover; Harvesting and Thrashing the Seed Crop.....(5c)

Honey poster, "It's All Good Honey," may be purchased for 15 cents. The poster is printed in four colors and is designed to aid in selling honey.

DISEASES OF BEES: Beekeepers in many parts of the country are suffering losses from the two serious brood diseases. In case any discolored or dead brood is difficult to diagnose with accuracy, send a sample to the Bureau of Entomology for examination. On request the Bureau will mail a box suitable for the sending of a sample and give detailed directions for preparing it for mailing. Many states have apiary inspection for the detection of these diseases and for the instruction of the beekeepers in their control. Information concerning the inspection systems may be obtained from the Bureau of Entomology.

PURCHASE OF BEES: When a beekeeper desires to increase the number of his colonies by purchase, the most commendable plan is to buy up any colonies in the neighborhood which are in the hands of those who through their ignorance of good beekeeping practice are unable to get a crop. The purchase of bees in combless packages is advisable only where the shipper and the purchaser are both expert beekeepers. Do not send money for shipments of bees unless you are sure of the shipper's financial standing and business integrity.

The Department of Agriculture does not sell or distribute queen-bees or colonies of bees of any race.

MARKETING: Where it is possible to develop a home market for the honey crop, this is recommended, but the beekeeper should be sure that he is not selling his crop so low as to lose the value of his labor. The Bureau of Agricultural Economics of the Department of Agriculture issues twice a month quotations giving the record of actual sales of honey on the leading markets of the country and these should be consulted before selling at wholesale. It also issues four reports annually on the crop conditions and the number and condition of the bees. These reports are free.

KEEP BEES BETTER.

Cardinal Points:

(1) Bees need in spring—plenty of stores, plenty of room for brood rearing and plenty of protection.

(2) Swarming during a honey-flow is undesirable because it reduces the crop. See Farmers' Bulletin 1198 for methods of control.

(3) During a honey-flow bees should be given plenty of storage room. Neglect of this may lose half the crop.

(4) Bees need protection from cold and wind in all parts of the country in which the winter temperature is often as low as freezing. See Farmer's Bulletin 1012 for methods. In unusually cold and windy districts cellar wintering is advised and Farmer's Bulletin 1014 gives the best methods.

(5) The successful beekeeper is he who studies his bees and is prompt with his manipulations. Beekeeping is not a paying business for the shiftless beekeeper. The specialist beekeeper is the most desirable from the standpoint of the industry because the small holder usually has not sufficient interest in the bees to see that they do their best. There is no reason, however, why a few colonies of bees will not be profitable, provided the owner gives them intelligent care.

(6) It is impossible to keep bees with profit in box hives or "gums." The use of movable frame hives cannot be urged too strongly.

(7) It does not pay to cultivate any plant for bees but it may be possible in some localities to improve the nectar resources by the planting of plants such as sweet clover on waste lands. If at any time the bees are short of stores, feed sugar sirup, but avoid the use of any sugar other than granulated and do not use molasses or glucose. Do not let the bees starve or even get so short of stores that they decrease brood-rearing before the honey-flow.

James I. Hambleton,
Apiculturist.

BEEKEEPERS' SHORT COURSE.

Each year in January in conjunction with the regular Farm and Home Week Program of the College of Agriculture, the beekeeping division of the Department of Entomology, University of Illinois, offers a complete program for beekeepers. The course is designed to cover the principles or underlying facts for beginners as well as topics of more general interest for the more advanced beekeepers.

Outside talent is generally secured to assist the University staff in presenting the short course. Those assisting with the 1929 program were Mr. M. D. Farrar of the State Natural History Survey, Mr. G. H. Cale, Associate Editor of the American Bee Journal, and V. G. Milum, Apiculturist of the University of Illinois.

In addition to the beekeeping subjects presented, the program of the College of Agriculture always has prominent speakers who are authorities in various fields of agriculture. Departmental programs are usually offered by the separate divisions of Agriculture with programs on Farm Management, Soils and Crops, Poultry, Dairying, Fruits and Vegetables. Thus visitors may round out their stay at the University by gaining information on a variety of subjects in which they are interested.

Those desiring information regarding future Short Courses should send a request to the College of Agriculture, Urbana, Illinois or the Beekeeping Division, Vivarium Building, Champaign, Illinois, to have their names placed on the mailing list for future Farm and Home Week Programs.

The dates for the 1930 Short Course are January 12 to 16. Plan now to attend.

CONSTITUTION OF THE AMERICAN HONEY PRODUCERS' LEAGUE.

ARTICLE I.

NAME.

Section 1. The name of this organization shall be, American Honey Producers' League.

ARTICLE II.

PURPOSE.

Section 2. To establish and maintain a truly national organization for the United States by:

(a) Protecting the interests, activities and rights of beekeepers in all lines in any manner not inconsistent with public policy.

(b) To publish and disseminate literature pertaining to bee culture and allied sciences in its practical and scientific aspects for the express purpose of uplifting the standards of beekeeping and lowering the cost of production of honey.

(c) To hold conventions of the membership for the discussion of any and all problems of beekeeping and to aid, encourage and foster beekeepers' meetings and public lectures devoted to beekeeping in schools, colleges and public societies in a manner consistent with paragraph (b) of this section.

(d) To aid and promote research in bee culture, nutrition of honey and honey marketing problems by the United States Department of Agriculture, the State Experiment Stations and public colleges and universities or any other agency devoted to such research.

(e) To assist in every educational and research way possible the solution of marketing problems of beekeepers, but not to enter specifically into the business of marketing honey or bee supplies.

(f) To encourage and stimulate an interest in honey through the promotion of nature study of bees.

ARTICLE III.

Section 3. The headquarters of the American Honey Producers' League shall be at such place as the Secretary may establish as his business address, and he shall be required to conduct the business of the American Honey Producers' League from such office, and all books, papers, records, and other property shall be kept there.

ARTICLE IV.

MEMBERSHIP.

Section 4. The membership of the American Honey Producers' League shall consist of three classes, viz.: Individual members, organization members and life members, as follows:

(a) Individual Members. Any person of good character who is interested in bee culture or any phase of the beekeeping industry is eligible to membership and may become a member upon application accompanied by the required membership fee, and agreeing to be governed by this constitution and by-laws.

(b) Organization Members. Any association, society or other organization organized in the interests of bee culture or any phase of the beekeeping industry is eligible to membership and may become a member by submitting proper application, accompanied by the required fee, and agreeing to abide by this constitution and by-laws.

(c) Life Membership. The American Honey Producers' League may elect to honorary life membership one individual each year who has performed a worthy service for the bee industry, or that may be distinguished for his scientific, industrial or administrative ability. Honorary life members shall be entitled to all rights and privileges of the American Honey Producers' League the same as any other member, but shall be exempt from all fees and dues.

ARTICLE V.

Officers.

Section 5. The officers of the American Honey Producers' League shall consist of a President, a Vice President, a Secretary, a Treasurer, a Board of Directors, consisting of five members, a Board of Managers, an Editorial Board and such committees as are necessary to carry on the business of the League.

Section 6. Four members of the Board of Directors representing four separate and distinct districts, as hereinafter provided, shall be elected annually by a majority vote of the members of the American Honey Producers' League in annual convention.

The elected Board of Directors shall elect the fifth director from the membership at large.

Section 7. One member of the Board shall be elected from each of the following districts, viz.:

District No. 1. Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, Pennsylvania, Delaware, District of Columbia, Maryland, Ohio, Illinois, Indiana, Michigan, Wisconsin.

District No. 2. Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Florida, Mississippi, Tennessee, Kentucky.

District No. 3. Minnesota, North Dakota, South Dakota, Iowa, Kansas, Nebraska, Colorado, Idaho, Montana, Utah, Wyoming, Nevada, California, Oregon, Washington.

District No. 4. Texas, Arizona, New Mexico, Louisiana, Oklahoma, Missouri, Arkansas.

Section 8. The Board of Managers shall consist of delegates elected by the membership of each affiliated organization, each organization being entitled to one delegate.

Section 9. The Editorial Board shall consist of five members (to be appointed by the President) as follows: One for five years, one for four years, one for three years, one for two years, one for one year. At the expiration of the term of each, another member shall be appointed to the position to serve five years.

ARTICLE VI.

Terms of Office.

Section 10. All officers shall be elected or appointed for terms of one year to serve until their successors are duly elected and installed.

ARTICLE VII.

Control of Members.

Section 11. The American Honey Producers' League as a governing body shall have jurisdiction and control over the conduct of all officers and members. Any member found guilty of dishonest practice that is believed to be harmful or discreditable to the American Honey Producers' League may be suspended or expelled from membership.

ARTICLE VIII.

Meetings.

Annual Convention.

Section 12. An assemblage of the members of the American Honey Producers' League shall be held annually, the time, place and date to be decided by a majority vote of the Board of Directors.

Quorum.

Section 13. Twenty-five members in good standing shall constitute a quorum at an annual convention or special meeting. Three members of the Board of Directors shall constitute a quorum of that body.

ARTICLE IX.

Voting.

Section 14. Each affiliated Organization Member shall be entitled to one vote for every twenty-five of its own paid-up members and fraction thereof over twelve, and each individual or life member shall be entitled to one vote in all meetings and deliberations of the American Honey Producers' League in annual convention. If an individual member acts as a delegate or representative of an organization member, he shall be entitled to such votes in addition to his personal vote as his credentials may indicate.

Any individual member may act as a delegate or representative for any other individual member in the same way as for organization member.

In no case can a vote be cast by any member in arrears for dues or lacking the proper credentials as required in this Constitution and By-Laws.

Credentials.

Section 15. All credentials, to be valid, must be in writing and shall be presented to the Secretary previous to the opening or roll call of meetings attended by such delegates or representatives. Such credentials must be dated and signed by the proper officers or individual members and show that the delegate presenting them was appointed by the organization or individual member or members which he represents within one year prior to the date of the meeting of the American Honey Producers' League in which he seeks to take part.

ARTICLE X.

Liability.

Section 16. No officer, member or committee shall pay out funds belonging to the American Honey Producers' League or render this organization liable for amounts exceeding the specific appropriations, which may have been made for such officer, member or committee respectively.

ARTICLE XI.

Constitutional Amendments.

Section 17. The constitution of this American Honey Producers' League may be altered or amended at an annual convention.

BY-LAWS.

ARTICLE I.

Application and Election to Membership.

Section 1. All applications for membership of whatever class must be submitted to the Secretary with the required fee.

Fees and Dues.

Section 2. (a). Individual Members. The annual fee for any individual members shall be $1.50.

(b) Organization Members. The affiliation fee for state or large territorial organizations shall be $12.00 and $6.00 for all local organizations less than state-wide, which includes all dues for the first year. The annual dues shall be $6.00 for every twenty-five of its own paid-up members or a fraction thereof over twelve.

ARTICLE II.

Duties of the President.

Section 3. The President shall be the directing head and chief executive officer, the interpreter of the Constitution and By-Laws when the American Honey Producers' League is not in session, and shall preside at all meetings. He shall act as Chairman of the Board of Directors, appoint committees, fill vacancies in office taking place between annual elections and call special meetings of the Board of Directors as provided for in the Constitution. He shall sign all agreements, and other documents requiring his signature, verify the annual report of the Secretary, and the Treasurer, take the initiative in all matters pertaining to the American Honey Producers' League, safeguard its interest at all times, and perform such other act or acts as may pertain to his office. The President shall receive no salary for his services, but if funds in the American Honey Producers' League treasury will permit he shall have his expenses, not to exceed $150.00 paid to the annual convention of the League.

ARTICLE III.

Duties of the Vice-President.

Section 4. Should the President be absent from a meeting or for any reason be unable to act, the Vice-President shall act for him. In the absence of both the President and Vice-President, a temporary Chairman shall be chosen by a majority vote of the members present at the meeting. In the absence of the President at the annual convention, the Vice-President shall have his expenses, not to exceed $150.00 paid to the annual convention, if the funds of the treasury permit.

ARTICLE IV.

Duties of the Secretary.

Section 5. (a) The Secretary shall officiate at American Honey Producers' League headquarters. He shall have general supervision of the League's business affairs, have charge of all books, papers, and other documents pertaining to his office, and be the custodian of all property belonging to the League, not otherwise provided for, keeping it properly insured when in his opinion it seems advisable to do so.

(b) He will conduct the correspondence of the American Honey Producers' League, prepare and distribute all notices and other literature pertaining to his office, receive applications, and keep a correct list of the names and addresses of all members of the League and dates of their admission to membership.

(c) The salary of the Secretary shall be as determined by the Board of Directors. He shall have his expenses not to exceed $150.00 paid to the annual convention of the American Honey Producers' League.

(d) He shall prepare and deliver to the President, at least ten days before the annual convention, an itemized report showing the work and financial receipts of the League for the current year.

(e) He shall receive and keep accurate records of all moneys paid to the League transmitting such funds to the Treasurer. He shall keep the necessary books in which shall be entered the amounts received and transmitted by him to the Treasurer.

(f) The Secretary shall give such bond for the faithful performance of his duties as may be required by the Board of Directors, said bond to be paid for by the League and kept by the President.

ARTICLE V.

Duties of the Treasurer.

Section 6. The Treasurer shall receive all funds transmitted to him by the Secretary and deposit such funds in a bank or banks satisfactory to the President. He shall keep the necessary books in which shall be entered the amounts of the funds received and disbursed by him, making payment by check properly signed by himself and countersigned by the President. The Treasurer shall give such bond for the faithful performance of his duties as may be required by the Board of Directors, said bond to be paid for by the League and kept by the President.

ARTICLE VI.

Duties of the Board of Managers.

Section 7. The Board of Managers shall serve as the nominating committee in the annual conventions.

ARTICLE VII.

Duties of the Board of Editors.

Section 8. The Board of Editors shall direct the policy of all publications and be responsible for all publicity emanating from the American Honey Producers' League.

ARTICLE VIII.

Order of Business.

Section 9. Unless otherwise provided by a three-fourths majority vote of the American Honey Producers' League, the order of business at an annual convention shall be as follows:

(1) Roll Call.
(2) Appointment of Committees.
(3) Reading of Minutes of last meeting.
(4) Receipt of petitions.
(5) Secretary's and Treasurer's reports.
(6) Report of the Chairman of the Board of Directors.
(7) Report of Committees.
(8) Unfinished business.
(9) Inauguration of officers.
(10) New business.
(11) Discussions.
(12) Adjournment.

Section 10. Robert's Rules of Order shall be the parliamentary guide of this League, subject to the Constitution and by-Laws, and to such official rules as may be adopted from time to time by the League.

Section 11. The By-Laws of this League may be altered or amended only at an annual convention.

MEMBERS OF ILLINOIS STATE BEEKEEPERS' ASSOCIATION.*

Adams, Clyde, R. R. 2, Bonnie.
Adams, Miss Edith, Earlville.
Adams, Ed., Strawn.
Adam, G. M., 304 E. Euclid St., Arlington Heights.
Aigley, Dr. J. E., 58 E. Fort St., Farmington.
Allen, F. O., Stockland.
Allgren, G. E., Bishop Hill.
Alexander, Luther, 1122 S. Washington, Harrisburg.
Amacker, C. F., Winfield.
Ambrose, Lemual, White Heath.
Ammon, Henry, Galena.
Anderson, C. F., R. R. 10, Mt. Vernon.
Anderson, C. J., R. R. 4, Box 102, Morris.
Anderson, C. J., Lilly Lake.
Anderson, L. H., 525 Morgan St., Elgin.
Annear, Roy, Mulkytown.
Applegate, J. F., 609 W. Beardsley Ave., Champaign.
Archer, W. L., McLean.
Attig, Fred, Ashton.
Ashley, W. C., Yorkville.
Augenstine, A. A., R. R. 2, Dakota.
Averill, Louis, 1417 June St., Kewanee.
Baer, Geo. W., Cissna Park.
Backart, Arthur, Sadorus.
Baker, Earl, Genoa.
Baker, Ralph, R. R. 2, Eldorado.
Baker, Raymond D., 3328 N. Neenah Ave., Chicago.
Baldwin, George, 1117 Greenleaf Ave., Wilmette.
Baltimore, Guy, Woodhull.
Bangs, E. H., 212 W. Washington St., Chicago.
Barr, C. W., Gardner.
Barekman, W. I., R. R. 2, Allendale.
Barr. H. I. & Son, Rock City.
Barrett, Edw. E., 333 S. Waiola Ave., La Grange.
Barthoff, R. J., Richmond.
Bassett, Harry J., 613 E. 5th St., Rock Falls.
Bates, Eugene, 807 W. 5th St., Kewanee.
Bauch, E. E., Freeport.
Baxley, Roy, Christopher.
Baxter, A. C., Myers Office Bldg., Springfield. (Honorary Member).
Baxter, E. J., Nauvoo.
Bearden, Joe, 1014 N. Snodgrass St., Taylorville.
Bean, Norval, R. R. 1, Eldorado.
Bean, Reginald, 1409 Forest Ave., Mt. Vernon.
Behan, John, Taylor Ridge.
Belk, Benny, Mosback.
Bell, Alvin, Ridgway.
Bell, B. F., Box 56, Kingston Mines.
Bell, Mrs. Paradine, Box 56, Kingston Mines.
Bellatti, Fred F., R. R. 1, Mt. Pulaski.
Belt, Forest, Morrison.
Belt, F. R., R. R. 5, Canton.
Bennett, H. E., Townsend St., Sycamore.
Bennett, James H., R. R. 3, Monticello.
Benson, Mr. & Mrs. James D., 413 Spring St., Galena.
Bent, J. M. Milledgeville.
Benton, T. E., Johnston City.
Bentz, Leo J., Woodstock.
Benz, Joseph, Kampsville.
Berglund, William T., Geneseo.
Berry, E. G., R. R. 4, Taylorville.
Beyers, Henry C., 1520 N. Monroe, Decatur.
Bishop, Frank, Taylorville.
Black, John W., 303 S. Elm St., Kewanee.
Boal, A. D., 94 Ross Ct., Downers Grove.
Bodenschatz, J. Adam, Box 272, Lemont.
Boedeker, F. A., 334 W. 118th St., Chicago.
Bolen, James, Dahlgren.
Bourey, Fred, Rock City.
Bowald, John, Secor.
Bowen, C. E., Lyndon.
Boyer, B. W., Jerseyville. (Deceased.)
Boyd, Senator Randolph, Galva.
Biegel, Wm. R. R. 3, Barrington.
Biesicker, Hiram L., Monticello.

* Includes 200 names who last paid during the year of 1928, and new and old members in 1930 to March 13.

Billam, J. F., R. R. 4, Harrisburg.
Binder, L. F., Harvard.
Bima, Willie, R. R. 1, Johnston City.
Birch, Reed, R. R. 2, Lockport.
Bradley, Lon, Morrison.
Braun, H. H. Williamsville.
Brelsford, W. H., Box 123, Kenney.
Brewer, Walter A., Attwood.
Briggs, F. E., 211 N. Hadden Ave., Arlington Heights.
Brigham, Wm. B., 1301 N. East St., Bloomington.
Bright, John, R. R. 1, Normal.
Brockman, L. H., Jerseyville.
Brokaw, T. X. L., Nebo.
Broje, John, 2116 Neva Ave., Chicago.
Brost, Joseph, 4333 Gage Ave., Lyons.
Brown, Chas., Woodhull.
Brown, Chas. W., Aledo.
Brown, C. W., 118 E. Bond St., Monticello.
Brown, Ed., Woodhull.
Brown, E. P., R. R. 2, Joliet.
Brown, E. W., Box 117, Willow Springs.
Brown, Will, Waddams Grove.
Brown, Lynch, Scott Company, Monmouth.
Bruner, E. H., 3826 Kostner Ave., Chicago.
Brunner, E. C., R. R. 5, Decatur. (Deceased).
Builta, W. C., 525 Catlin, Rockford.
Bunker, D. H., La Fox.
Burdzilduskas, Joe, N. 4 Johns St., Pana.
Burgess, G. L., Bement.
Burkart, C. C., Mendota.
Burnett, A. Lee, 1428-31st St., Rock Island.
Burrows, Gene, 10330 Artesian Ave., Chicago.
Burtis, John C., El Paso.
Busch, Martin, 5011 Moody Ave., Jefferson Park.
Bush, Frank, Jerseyville.
Byer, Arthur, Elizabeth.
Cable, Geo. S., El Paso.
Calame, Tom, Witt.
Caldwell, C. S., Elvaston.
Caldwell, L. R., Mt. Vernon.
Cale, G. H., Hamilton.
Campbell, E. J., 1208 Leland Ave., Springfield
Carlsen, Christ, R. R. 2, Gardner.
Carlson, Chas., Woodhull.
Carlson, E. C., 47th St. and Sunset Rd., LaGrange.
Carlson, C. Phillip, Geneva.
Carlson, P. A., Galva
Carmichael, W. Philip, Stanford.
Carnes, Jay, Woodhull.
Carpenter, Michael, Cortland.
Casson, Fred, R. R. 1, Farmington.
Chamberlin, Marc, 304 N. California, Sycamore.
Chambers, J. O., Pierson.
Chamness, E. A., Carterville.
Chandler, Chester, R. R. 1, Alexis.
Chandler, Paul, Aledo.
Chesterman, P. L., Tower Hill.
Clark, Geo., 237 W. Empire, Freeport.
Clark, Frank, Ridott.
Clausson, S. S., Oregon.
Cleveland, Frank, Prophetstown.
Clifford, Irl, Altona.
Clower, H. L., Morrisonville.
Cluck, N. A., McConnel (address unknown).
Coll, E. F., Cambridge.
Collins, Thos., Wellington.
Collman, Nathan, Galena.
Concidine, Frank, 515 DeKalb Ave., DeKalb.
Concidine, Roy, 519 DeKalb Ave., DeKalb.
Confer, Edgar, Lindenwood.
Conner, John, R. R. 2, Caldwell, N. J.
Cook Bros., Pecatonica.
Coombs, J. F., Shagbark Lake, Des-Plaines.
Copenhaver, W. E., Mansfield.
Coppin, Aaron, Wenona (deceased).
Coppin, Mrs. Aaron, Wenona.
Cornelius, W. H., Dow.
Courtney, R. H., R. R. 7, Canton.
Cox, Bernard, Woodhull.
Craske, W., 2148 W. 107th Pl., Morgan Park, Chicago.
Craver, J. A., McHenry.
Cronk, H. M., 6620 S. Hoyne Ave., Chicago.
Crow, W. E., Gibson City.
Crum, F. O., Palmyra.
Curphy, John, Onarga.
Cushman, Samuel, Room 506, 6 E. Lake St., Chicago.
Cyka, Joseph F., 252 Illinois Ave., Elgin.
Dadant, C. P., Hamilton. (Also Honorary member.)
Dadant, H. C., Hamilton.
Dadant, L. C., Hamilton.
Dadant, M. G., Hamilton.
Daniel, Francis, 710 Dewey Ave., Kewanee.
Danner, U. K., R. R. 2, Mt. Vernon.
Dauhmer, H. J., Marion.
Davis, Ward O., R. R. 3, Eldorado.
Davy, Ernest H., Morris.
Day, Alva, Lovington.
Dean, D. H., Congerville.
Dean, L. A., R. R. 1, Big Rock.
Decker, F. W., Jerseyville.

Decker, H. U., Aledo.
Denning, James E., Joy.
DeSort, Frank, 1308 Ottawa St., Lincoln.
Devillez, Fred, Harrisburg.
Dicus, Dr. J. B., 159 N. State St., Chicago.
Diedrich, Mr., DeKalb Ave., DeKalb.
Diercouff, J. W., Ridgeville.
Dineen, J., St. Nicholas Hotel, Springfield.
Distler, John, West McHenry.
Dodge, Aldon A., 508 W. Grant St., Streator.
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